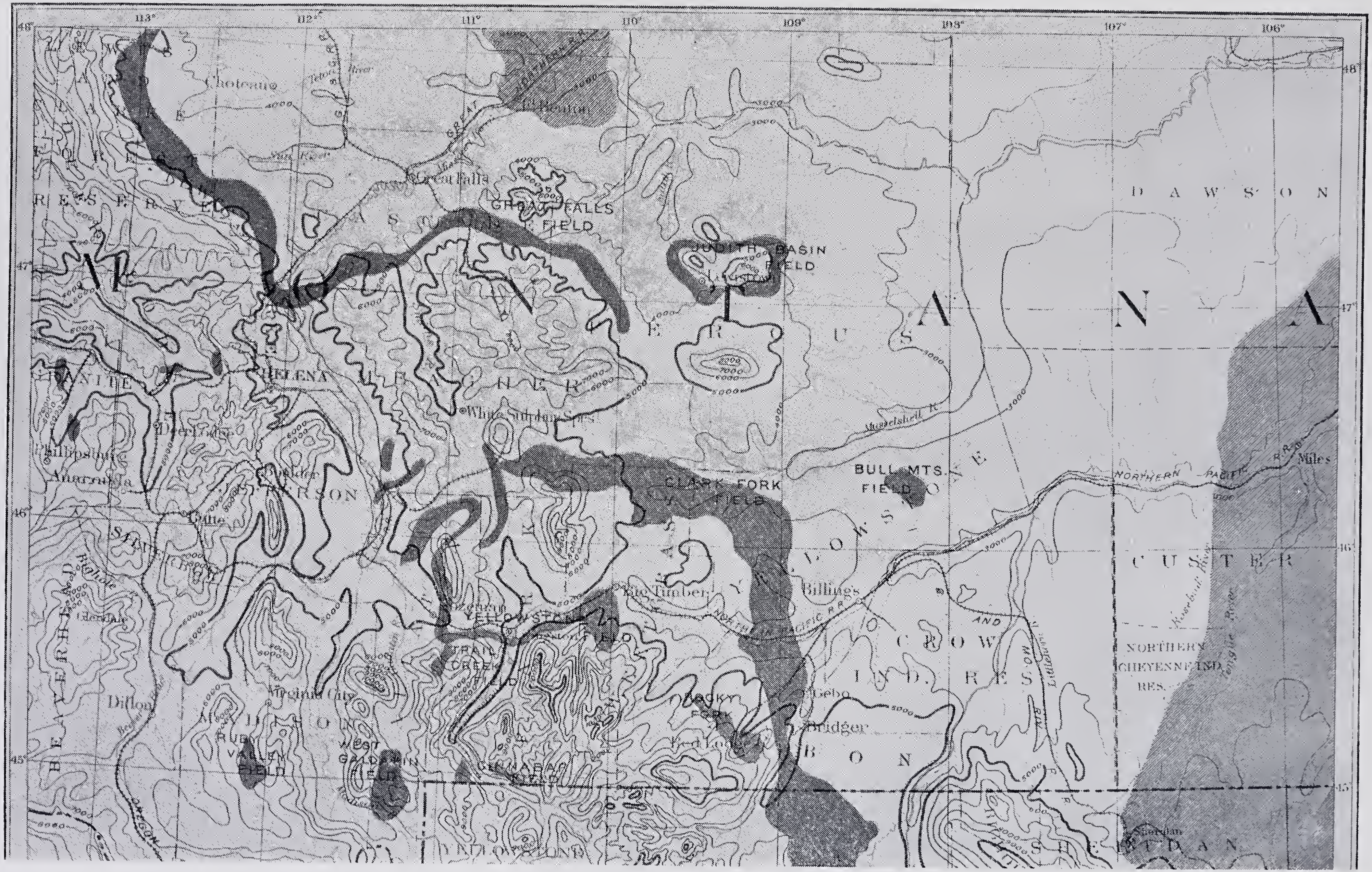
FOURTH ANNUAL REPORT OF THE INSPECTOR OF COAL MINES OF THE STATE OF MONTANA

HOWARD F. WELSH
INSPECTOR

JANUARY 1, 1905



MAP OF MONTANA SHOWING COAL FIELDS

FOURTH

Annual Report

of The

Inspector of Coal Mines

of The

State of Montana

HOWARD F. WELSH, Inspector

JANUARY 1, 1905

HELENA, MONTANA
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Office of State Inspector of Coal Mines,
Helena, Montana, Dec. 31st, 1904.

To His Excellency, Joseph K. Toole, Governor of Montana:

Sir:—I have the honor to submit to you my fourth annual report as Inspector of Coal Mines, of the State of Montana, for the year ending December 31st, 1904.

Very respectfully,

HOWARD F WELSH,
State Coal Mine Inspector.

INTRODUCTION.

Few people realize the important factor that coal is in modern civilization. England's position as the commercial leader of all nations for a long period was primarily due to the fact that she possessed wonderful coal beds. The United States has passed her in coal production, and our annual output is rapidly increasing. Montana is fortunate in possessing, in addition to her immense area of tilable soil and almost unknown wealth of precious metals, an area of thirteen thousand square miles of coal-bearing formation, ranking ninth as compared with the other states in this regard. Practically no coal was mined until the year 1888. That year saw the commncement of our coal mining operations. In the year 1893 the production had increased from almost nothing in 1888 to about 900,000 tons. During the next two years there was an increase in production of 600,000 tons annually, reaching in that year, according to the report of the United States Geological Survey, an output of 1,504,193 tons.

The greatest changes that have occurred during the past few years have been the installation of modern plants for cleaning the product produced and the replacing of old plants by modern ones. One example of the latter is the Chestnut mine, located on the Northern Pacific railroad, eight miles east of Bozeman. Coal was discovered here in 1867, and it was the first producer in the state. Within the past two years the work of development and installation of a large and modern plant has been going on. These changes will involve the expenditure of a large amount of money and will result in making what was formerly a small camp a large one, with a corresponding increase in the amount paid for labor.

The past few years have seen a large increase in the number of operations. Some of these new and small operations are destined to become much larger producers, in fact, the inspector believes that some of the latter before many years will become larger operations than any the state has now. Forty-eight properties report a production for the year of 1903 of 1,553,285. They employed on an average, as near as can be estimated, over 2,500 men.

The condition of the coal mines of the State of Montana will compare favorably with any state in the Union, notwithstanding the industry is in its infancy.

In the United States Geological Report of 1900, Montana is put in the lead of all other states as regards the percentage of output obtained by the use of mining machines.

The industry has been fortunate as compared with other portions of the country, in having no serious labor troubles. The only strike during the past year was at Red Lodge over the checkweighman, which lasted for about a week.

This matter was adjusted to the satisfaction of all parties by arbitration. The great majority of the employes of the coal mines are members of the United Mine Workers of America and their recent policy has been to have an annual meeting with the operators of all the companies, and enter into an agreement which covers all points over which disputes might arise. This practice cannot be too highly recommended.

During the past four years there have occurred thirty-three fatal accidents, twenty-six of which were the results of falls of rock or coal; two drivers and a switchman were run over by trips, and four resulted from miscllaneous causes. The latter comprise one miner being killed by riding a loaded trip against the rules of the company; one miner being hit by a falling timber, which he had erected but failed to properly secure; one miner was killed by an explosion of dynamite which happened from some unknown cause, and one man caught in a fan while oiling it. It is thus seen that very nearly 80 per cent of all the fatalities were caused by falls of rock or coal. The inspector has full reports of the Coroner's inquests in his office and in nearly all cases immediately went to the place of the accident and made a personal investigation. One of the points which has been strictly insisted upon is that plenty of props should be furnished the miners and that the timbers should be kept as close as possible to the working face. Some of these accidents could not have been avoided, but a great majority were caused by the carelessness of the miner in not taking down portions of the roof or not carefully securing same by props properly placed. It is an utter impossibility for the superintendent or underground foremen of a large operatiton to watch all the working places at the same time. The inspector would recommend that, if possible, those in authority should see that all the miners were properly

protecting themselves, and in case any were found that were careless in their timbering or negligent, that their places were filled with more careful and trustworthy men.

There is a growing tendency throughout the state to provide better houses for the employes and in some sections the employes are provided with houses having many conveniences, such as electric lights and running water.

Having been in a position to know the condition of the coal mines in the state for the past eight years, the Inspector feels safe in saying that at no previous time have the general conditions been as good as they now are with respect to ventilation, drainage and general safety.

The third annual report will be included in this, the fourth report of the Inspector. Also portions of a report by L. S. Storrs on the Geology of the Coal Fields of the State, some of the tables of coal tests given in a former report, and a description of the bituminous coal breaker erected at Stockett by Lewis Stockett.

Third Annual Report.

INTRODUCTION.

The Inspector will briefly treat of the several coal mines now in operation in the state, mentioning any changes in managemen which have taken place during the year, and the various improvements which have been made by any of the companies.

CARBON COUNTY.

Rocky Fork Coal Company—During the past year the property of this company was transferred to the Northwestern Improvement Company. The former general manager of the latter company, Mr. George Bush, resigned his position and Mr. H. J. Horn, formerly assistant general superintendent of the Northern Pacific Railway Company, was appointed to succeed him. Mr. Robert Pettigrew, who for several years was superintendent of this mine, has been promoted to the position of general superintendent, being in charge of operatitons at this point, as well as of the properties operated by the same company at Chestnut and Mountain Side.

Development work on this property has been pushed to the utmost, and the output of coal has been increased about 25 per cent over that of any preceding year.

Bridger Coal Company—Mr. George Hough still remians manager of this company. But little development work has been done on this property during the year, and the work has mainly consisted of pulling pillars.

Gebo Coal Company—This property was formerly operated as the Clarke Fork Coal Mining Company. An injunction against the operation of this mine, until the laws of the state were complied with, was issued in March, 1902, at the request of the Inspector. The injunction has been raised this year and the property is being worked on a small scale.

There are three other mines being operated near the Gebo mine, known as the McCormick, the McCarthy and the Black

Diamond mines. They develop the same vein, which is being developed at Gebo, but they are being worked on a very small scale.

CASCADE COUNTY.

Cottonwood Coal Company—Mr. Lewis Stockett still remains manager and James Pierson superintendent of this property. A new mine, known as "Number 5," has been developed to a considerable extent during the year, by the three entry system. When the contemplated developments are completed this mine will become one of the largest producers in the state. A new cleaner has been constructed, which provides for the separation of the slate from the coal, both by hand picking and by mechanical means.

Anaconda Copper Mining Company—F. W. C. Whyte is manager of this property and J. J. Kinney suprintendent. This property has been operated on its usual scale during the past year, except for a few months, when the smelters of the Amalgamated Copper Company at Anaconda were shut down.

Rock Springs Coal Company—Ed Gerber is manager of this property and Mr. Pierson superintendent. This mine has been operated intermittently during the past few years. Improvments which were started last year have been completed during the present year. These consist principally of a new boiler and a compressor plant. Last year the Inspector insisted upon the immediate installation of a fan. The ventilating shaft proposed has been completed and the fan installed during the present year, so that now there is a direct system of ventilation. The number of men employed has increased until the output has become from 300 to 400 tons per day.

Nelson Coal Company—This property is operated by the two Nelson Brothers. The development of this mine, which was started last year, has been pushed this year, and the property is now in shape to ship several hundred tons of coal a day.

GALLATIN COUNTY.

The Northern Pacific Railway Company acquired the properties at Chesnut, which were formerly operated by the Chesnut Coal Company and the Mountain-Side Coal Company. These mines are under the supervision of H. J. Horn, general manager of the Northwestern Improvement Company, and Robert Pettigrew is general superintendent. At the Chesnut property the

boiler plant has been increased and a compressor plant has been erected. Air has replacd steam as a motive power for the hoisting engine, which is located inside the mine, and the ventilation has been much improved. A large washing plant was nearly completed when it was destroyed by fire during October. About $75,000 had already been expended on this plant and when completed it was to have cost about $100,000. These properties have been practically shut down for the past three months, and it was understood that work would not be resumed underground until the washing plant was completed. The management has stated that another washer will be erected as soon as possible.

Storrs—The coal properties at this place were acquired by the Amalgamated Copper Company during the year 1902. Work has been pushed both in the mines and on the outside during the past year. The surface plant is most complete and includes 100 coke ovens already finished and another hundred in the course of construction. It is to be hoped that the expectations of the management of this company, both as regards the quality and quantity of coal, will be fully realized by further development. Mr. G. N. Griffin is superintendent of this property.

PARK COUNTY.

The Montana Coal and Coke Company—Mr. Henry G. Merry remains manager of this property and Mr. J. F. Kent superintendent. Under the management of Mr. Merry a great deal of development work has been done during the past year, the condition of the mines materially improved and the present output of coal and coke exceeds that of any former period. The Inspector understands that even with the present increased output the company cannot nearly fill its orders.

Cokedale—The coal property at Cokedale, owned by the Helena and Livingston Smelting and Reduction Company, of which Samuel T. Hauser is president and George H. Hill manager, has been put in operatiton after a period of inactivity of eight years. The work of unwatering the mine and repairing and adding to the old plant was done under the supervision of Mr. George T. Wickes of Helena. At present the work is under the direction of J. J. Kinney as superintendent, whom I have stated is also superintendent of the Amalgamated Copper Company coal properties at Belt.

The old washer has been repaired, the coke ovens repaired and fired and the work of development is being pushed. New air-

ways are being driven and the old ones opened up. A large fan is on the ground and will shortly be installed.

CARBON COUNTY.

Rocky Fork Coal Company.

1903.

January 13—August Brunetti, a Grman, leg badly lacerated; caused by his falling in front of a loaded car. Accident happened on outside tracks leading to rock dump.

January 14—E. L. Hendrickson, had three toes crushed by a piece of rock falling on them.

January 29—Thomas Alice, an Italian miner, was instantly killed at face of east entry by a piece of sand rock striking him on the head.

February 18—Matt Koski and Alex Aho, both seriously injured by a premature explosion of dynamite while they were engaged in thawing the powder.

February 19—William Lantis, an American miner, sustained a broken thigh bone and dislocated hip from a fall of coal.

March 30—And. J. Makala, a Finnish miner, was injured about face and head by a fall of rock.

May 12—Jacob Kiekkala, a Finnish miner, had his leg broken by a fall of rock at face of room.

July 15—Matt Warilla, a Finnish miner, was instantly killed by a fall of rock at the face of room 29, fifth east.

August 18—Gorge Luoka, a Slav miner, had his leg broken by falling in front of a loaded car at face of his room.

October 13—William Anderson, a Finn boy, was seriously injured from a fall of rock at the face of his room, resulting in his death two days later.

October 17—Peter Hova, a Finn miner, was instantly killed by a fall of rock at the face of room 30, fifth east.

November 4—Sam Butanen, a Finnish miner, had two legs broken by a fall of rock at face of No. 6 Water Level.

November 4—William Jamonski, a driver, fell in front of a loaded trip of cars, was dragged some distance and when taken from under the cars he was dead.

November 5—John Yunga, a Finn miner, had one leg broken at face of room 59, second west.

CASCADE COUNTY.

Cottonwood Coal Company.

1903.

February 1—John Edstrom, a drill runner, had his finger cut off by core barrel.

March 20—John Mullery, a driver, was caught by roof and had his back injured.

March 23—Felice Menghini, a laborer, had his foot crushed by fall of slate.

April 17—John E. Koeste, a machine helper, had his back hurt by fall of coal.

April 20—Peter Swetz, a driver, caught his finger in car and had it cut off.

May 2—Nels Olsen, a shooter, had his leg sprained by fall of slate.

May 5—John Mesarnek, a loader, had his hip dislocated by fall of slate.

May 21—Altura Centori, a loader, had his leg broken by a car falling on same.

July 7—George Hurlburt, a rope rider, had his skull fractured by falling off trip.

August 7—Mike Knoskey, a loader, was bruised by fall of coal.

October 27—John Rakkola, a loader, had his leg broken by a fall of slate.

Anaconda Copper Mining Company.

1903.

March 11—Charles Nara, lost left eye.

March 26—Mat Podbivsic, had second, third and little fingers amputated, also part of hand; leg bruised.

May 26—Charles Gilman, had face burned.

October 5—Evert Silda, was bruised on back and hips.

Rock Springs Coal Company.

1903.

February 10—Jacob Herman, bruised leg.

July 18—Charles Zusch, injured about face by premature explosion of dynamite.

October 12—John Anderson, overcome by powder smoke; lost part of two fingers by being burnt with miner's lamp.

November 5—Avel Salo, bruised on leg by fall of coal.

GALLATIN COUNTY.

Washoe Copper Company.

1903.

John Rolla had back bruised.
Peter Backshaw, two teeth knocked out.
Mike Bicko, slightly squeezed.
Edward Ward, slight bruise.
William Crumbit, finger injured.
John Eckman, generally bruised.
John Managan, small shin bone fractured.

Helena and Livingston Smelting and Reduction Company.

1903.

September 28—George V. Lewis, had collar bone broken by having bridge fall on him in mine.

The total number of accidents which have occurred in the coal mines of the state during the past year are thus seen to have been 42, 5 of which were fatal and 37 non-fatal. The increased number of non-fatal accidents is accounted for by the fact that a more complete record of accidents has been kept than heretofore. Although all the coal properties of the state have had an increased output over that of last year, the Inspector is pleased to be able to state that the total number of fatalities have only been 5 as against 12, which occurred last year.

GENERAL REMARKS

The Inspector believes that all of the mines of the state are in better condition than ever before, and that all of the remedies suggested by him, which might add to the safety and health of the miners, have been fully complied with by the operators. In each of the fatal accidents which have occurred, the Coroner's inquest has rendered a verdict that the fatality was caused either by carelessness or conditions existing which were beyond human control. It can also be stated that in but two instances has the Inspector been notified by any of the employes of the various coal mines of the state that they had any grievances. In the first instance the writers of the letter acknowledge that they had been misinformed. In the scond instance the Inspector asked the writers to state definitely what the grievances were, and having received no reply, believes that the matter was fully adjusted to their satisfaction.

Although the Inspector has not, at this time, complete data

relative to the production for the past year, he believes that the output for the year will be greater than that of any preceding year in the history of the state. At the same time he believes that the production has not kept pace with the consumption, and that of necessity other coal fields must be shortly developed to meet the demand caused by this condition. One of the largest coal fields in the state, which contains several seams of excellent coal, remains as yet undeveloped. The field referred to is known as the Bear Creek Coal field, and lies about 18 miles south from Bridger, the present terminus of the Clarke Fork branch of the Northern Pacific railway. This field is practically controlled by three companies. The largest tract of this field is controlled by Elijah Smith of Boston and his associates, and two other large tracts are owned by the Amalgamated Copper Company and the Northern Pacific Railway. It is to be hoped that this field will be developed during the next year.

Very respectfully submitted,

HOWARD F. WELSH.

State Coal Mine Inspector.

Fourth Annual Report.

The various operations will now be taken up by counties. A general descriptiton of the plants and operations will be given, stating improvements which have been made and their present condition.

CARBON COUNTY.

Rocky Fork Coal Company—The mines of this company are located at Red Lodge, the county seat of Carbon county, and are owned by the Northwestern Improvement Company, a subsiduary company of the Northern Pacific Railway Company. H. J. Horn, the general manager of the Northern Pacific Railway Company, is also general manager of the Improvement company. Robert Pettigrew is superintendent, being general superintendent of the coal properties of the Northern Pacific Railway Company in Montana.

These coal mines are the largest of any in Montana. Development was first begun in 1887, but the output was small for the two succeeeding years. The maximum output of this property was reached in the year 1903, when it was 541,060 tons.

The Red Lodge coal deposits are contained in a series of massive gray sandstones and shales, the latter predominating. Mr. Cassius A. Fisher, in a report on the "Coal of the Big Horn Basin, in Northwestern Wyoming," places this series near the middle of the Laramie formation as represented in Central Wyoming. The coal measures occur within a series of about 1,000 feet thick. There are seven beds of coal developed in the Red Lodge mine, varying in widths from 5 to 14 feet, and comprising a total thickness of approximately 54 feet.

These different deposits are designated as Nos. 1, 2, 3, 4, 4½, 5 and 6. Beginning at the top, No. 1 has a thickness of 5 feet, with a 2 inch layer of bony coal near the middle. It is overlain by massive sandstones and underlain by so-called fire clay. No. 2 is 7 feet thick, overlain by an impure, coaly shale, varying in thickness from a few inches to 2 feet. No. 3 has a total thick-

ness of 14 feet, with many shale intercalations. Seam No. 4 is 10 feet 6 inches thick and contains several small partings. No. 4½, a horizon recently developed in the Red Lodge mine, has a thickness of 4½ feet with one 2 inch parting of bony coal. The roof is composed of massive, gray sandstone, the floor of a gray, compact clay. Seam No. 5 has a total thickness of 11 feet, but contains numerous shale intercalations which will aggregate 4 feet. A 2-foot layer of soft, gray, sandy shale immediately overlies the coal, merging upward into massive, gray sandstone. Bed No. 6, the lowest in the series, is 5 feet thick. It has a roof of hard, gray shale, varying in width from 6 inches to 3 feet. The product of these different beds shows some variation in quality. That of Nos. 2 and 4 is preferred as domestic and steam coal, while No. 6 is best suited for metallurgical purposes. In addition, 13 coal horizons are reported to occur below, 5 of which are said to be of workable character. The coal measures outcrop along the east bluff of Rocky Fork, with a varying southerly dip of 17 degrees at the Red Lodge mine, but this dip rapidly decreases to the southeast and south.

The property is developed by two main slopes in veins "No. 2" and "No. 4," 1,800 and 2,500 feet long, respectively. By far the greatest development has been done in vein No. 4, the workings of which are known as the "No. 4 mine." The roof of this vein is sandstone with a floor of fire clay 1½ to 4 feet thick on sandstone. A cross section of this vein taken from the roof down is as follows: Soft coal, 2 ft, 3 inches.; slate, 2½ inches; hard coal, 3 ft, 6 inches; slate, 0 ft., 0½ inches; hard coal, 3 ft., 0 inches; slate, 0 ft., 0¼ inches; hard coal, 1 ft., 6 inches.

From slope No. 4 five levels have been driven to the east, and four levels to the west.

The third and fourth east levels in No. 4 mine have been driven over 9,000 feet from the slope, or nearly two miles. The second level west has been driven about a mile from No. 4 slope. This gives an idea of the large area worked on this vein, the workings being about half a mile wide on the pitch of the vein, by three miles long on the strike of the vein.

The workings of the other veins, as well as the recent development work done and new work planned, will not be taken up here, as it will appear in a special report made to the Governor on the ventilation on March 18, 1904.

The outside plant of the company is completely modern. A 600-ton Leuhrig washer was completed early in 1903. Previous to its completion the slack coal was dumped into the waters of Rock creek. Senate Bill No. 56, passed by the Seventh regular session of the Legislative Assembly, prohibited this practice. Such small coal is now washed, making a commercial product, and the overflow water from the washer carrying the very fine coal and dirt in suspension, is settled alternately in two reservoirs, which prevents any appreciable pollution of the waters of the creek.

During November, 1902, a local squeeze came on in a portion of the third east entry of No. 4 mine, completely stopping the mining of coal on this entry. The management of the company went to great expense and pains to save and reopen the workings closed.

A regular inspection is daily made for gas in this mine. It may be stated that it is seldom found and never in dangerous quantities. The condition of haulage and airways has always been found good, and everything within the power of the management has been done that could in any way preserve the lives or health of the miners employed.

Other outside improvements consist of new warehouse, blacksmith shop, machine shop, carpenter shop, a large addition to the electric light building, in which another McEwan engine, with an alternating generator for lighting the city, and an additional direct current generator has been installed. During the past four years two 250 H. P. Aultman-Taylor water tube boilers, small hoist to haul coal from No. 4 to No. 2 steel tipple, a set of railroad track scales, a new box car loader and three additional fans have been installed, a 20-ft. fan at No. 2 (steam), a 5-ft. fan at No. 6 (electric) and a 3-ft. fan at No. 1½ (electric).

Bridger Coal Company—The mines of this company are located at Bridger, the present terminus of the Clark Fork branch of the Northern Pacific Railway Company. These mines were first developed by T. P. McDonald, now located at Thermopolis, Wyoming, about the year 1897. Senator W. A. Clark secured the property and during the years 1898 and 1899 installed a large and complete plant. The equipment consists of a power house, containing four boilers 66 inches by 18 feet, rated capacity 125 horsepower each, supplying steam to operate two high-

speed McEwen engines, rated capacity 250 H. P. each. These engines drive two 100 K. W. bipolar link Belt electric dynamos generating at 500 volts, supplying power to operate one 250 H. P. electric hoist; one 80 H. P. Link Belt electric locomotive; one 60 H. P. Worthington three plunger electric pump to supply water works system; one 30 H. P. electric pump for mine; seven Link Belt electric chain breast mining machines; one 30 H. P. ventilating fan, and smaller motors used for various purposes. The tipple is equipped with Phillips dump and shaking screens. The Ottumwa Box Car Loader is used. The machine shop is ample for keeping the machine in proper repair. Capacity, 1,500 tons per day. The equipment at this mine is all first class and second to none in Montana. The vein pitches about 12 degrees, is about 4½ feet thick and is developed by a slope over 3,000 feet in length.

George Hough has been manager of this property for two years, succeeding Henry R. Crocker, and Mr. W. R. Dickson is superintendent.

During the past year S. H. Glidden, agent, senator-elect from Carbon county, has succeeded the Bridger Coal company, acting for eastern capitalists.

The coal seam occurs in the Laramie formation, and is in the Clark's Fork Field, which field extends southward to the Big Horn Basin Field of Wyoming. But little in the way of development work has been done in this mine during the past two years. The main work has been done to the south of the slope, and at the face of the south entries the coal became so thin, owing to a portion of the vein being displaced by a parting of rock, that these entries were stopped. What coal there is makes an excellent steam and domestic coal. Under the conditions existing the management deserves great credit in keeping this mine in operation.

The output for the past two years has been maintained at about 50,000 tons per year. The cost of mining is higher than competing coals, but the cost of production is met with the higher prices secured in the market.

Gebo Coal Company—This property was opened up by Mr. Sam Gebo, now manager of the Frank Coal property at Frank, Alberta, B. C. It was acquired by Messrs. Johnson and McCarthy, in 1898, who at that time owned the Chestnut Coal prop-

erty. The property was worked then by a company known as the Clark Fork Coal Mining Company. A large modern electric plant was installed by the Link Belt Machinery Company of Chicago. The coal is hauled one mile from the mouth of the slope to the tipple, which is of steel, equipped with shaking screens. Owing to lack of capital and litigation, there have been several periods of idleness.

During the year 1902, the company operating this property was known as the Clark Fork Mining Company. Owing to the management not complying with the laws, the Inspector took the matter before the County Attorney of Carbon county, and during March, 1902, the Hon. Frank Henry, Judge of the Sixth Judicial District, issued an injunction against the further operation of the mine. This injunction was raised in 1903.

The vein of coal developed is about 6 feet thick. A slope over 2,000 feet in length has been driven, the pitch of the vein averaging about 6 per cent. The coal is lignite, having a peculiar structure. It is much banded—bands of bright coal alternating with bands of a dead luster—and throughout the seam is disseminated considerable bony coal, which necessitates much sorting in the mine. The vein has a few inches of fire clay for a floor and between the top of the coal and the overlaying massive sandstones there is several feet of shaly rock which requires considerable timbering to maintain.

The present manager is Mr. H. H. Griffith and the superintendent is Mr. J. E. McLaughlin. Mr. McLaughlin found the property in bad shape, and being a practical coal miner, has improved the condition of the mine somewhat, in the way of making the haulways safe and in the way of ventilation. It will be necessary to spend considerable money to put the property in good shape, so that any considerable output can be maintained. But 2,000 tons was mined in 1903, but the management estimates an output for the year 1904 will approximtae 25,000 tons.

Carbon Coal Company—Hon. J. C. McCarthy, senator from Gallatin county, is owner and manager of this property. There has been considerable litigation which has been decided in favor of the company. Work is now being pushed in the mines and the output will be greatly increased during the year 1905.

CASCADE COUNTY.

Cascade County has been in the past and is still the biggest producer of coal in the state, reaching its maximum output in the year 1900 of 1,146,534 tons. During the past four years it has maintained a steady output of nearly 800,000 tons.

Cottonwood Coal Company—The mines of this company are located at Stockett, the terminus of a branch of the Montana Central Railway Company, which starts at Great Falls. The company is a subsiduary company of the Great Northern Railway Company. Mr. Lewis Stockett is manager, having opened up the property, and James Pierson is superintendent. There are five mines opened up here, three of which have been worked out, one of which has opened up all available coal and a new mine known as "No. 5," which has been opened up and developed during the past two years. The coal is mined from a vein of the Kootenai group of the lower Creaceous measures, having a total thickness of 9 ft., 3 inches. Its quality and nature is fully described in an article on the breaker erected on this property during the year 1903, by Mr. Stockett. The mines of this company are the source of supply of coal for the Great Northern Railway Company in this state. The output for the past two years has averaged about 400,000 tons. Two additional boilers have been added to the old plant. The greatest improvement has been the coal cleaner. Two air shafts have been completed in the No. 5 mine and two fans erected. The No. 5 mine of this company is in splendid shape, and in all ways will compare favorably with any mine in the country. Thirty-four Harrison mining machines and twelve Rand air drills are in use on this property.

Anaconda Copper Mining Company—The mines of this company are located at Belt, a station on the Neihart branch of the Montana Central Railway. F. W. C. Whyte is manager of this company and J. J. Kinney, who has been superintendent of the property since Marcus Daly developed the property, is still in local charge. The vein developed is the same one as at Sand Coulee and Stockett. In fact, this vein of coal is the only workable one in the Belt field. An extension of this field in the Judith Basin field has been recently quite well developed by several small companies. As seen in the section of this vein (see article on Stockett Breaker) the lower bench is a coking coal.

This is mined and loaded separately from the rest of the vein, washed and coked, all of the product being shipped to the smelters of the company at Great Falls and Anaconda. The mines at Belt are very extensive, having many miles of haulage and airways. The haulage is done entirely by rope. There is one main tail-rope system, about a mile long, running through the main entry to the tipple. As the vein of coal has many rolls, there are several independent rope systems which handle the cars from the partings nearest the working faces, to the main parting. The mines are in perfect shape. There was a shutdown for about five months the latter part of 1903 and the first two months of 1904, owing to there being no demand for coal. During the past year about five hundred and sixty men have been employed. Twenty-two Ingersoll-Seargent punchers are used in this mine. There have been no improvements made in either the plant or in the mine, in the way of installations during the past two years. The output of the company in coal and coke for the year 1903 was 177,704 tons and the estimated total tonnage for the year 1904 is 142,783 tons. The Inspector is pleased to say that there has been no fatal accident during these two years of operation.

Rock Springs Coal Company—The mines of this company are located at Sand Coulee. The vein is the same as opened at Belt and Stockett, but at Sand Coulee is somewhat thicker than at other points in the field, there being about seven and one-half feet of coal. Ed. Gerber is manager and superintendent of this property. The output for the year 1903 was 104,800 tons and the estimated output for the year 1904 is 75,000 tons. There have been no improvements in the way of installations the past year.

Nelson Coal Company—The mines of this company were acquired and work started during the year 1902. They are located at Sand Coulee. The operations not yet being extensive, a furnace gives a good ventilation. The property is owned and managed by the two Nelson Brothers. The output has been increased during the past two years. In 1903 the output was 53,000 tons and for the year 1904 this amount has been increased over 100 per cent. A portion of this coal is sold to the Great Northern Railway Company. The plant of this company has been added to by new boilers and a compressor. A change from pick to machine mining took place November 1, 1904.

CHOUTEAU COUNTY.

There are several small operations in this county which mine a small amount of lignite coal for local use. The largest of these are located near Havre and supply Havre and vicinity. The total production of this field is estimated to be about 7,000 tons a year.

CUSTER COUNTY.

There are a few small operations in this county which produce about 10,000 tons of inferior lignite for local consumption, principally used at Miles City. These small properties are only worked to any appreciable extent during the winter season.

FERGUS COUNTY.

There are no records of the production of coal in this county prior to 1899, when the output was about 3,000 tons. This output was increased to 10,000 tons in 1900, and has gradually increased to the maximum production in 1903 of 32,000 tons. The completion of the Montana railroad, which connects with the Northern Pacific at Lombard, from Harlowtown to Lewistown, opens up a new country. Increased populatiton in this section will mean that this field will undoubtedly be opened up on a much larger scale very shortly. The best developed mine in this section is operated by the Spring Creek Coal Company, which is located about three miles from Lewistown, the principal market for its output. The company own 820 acres of deeded land located on Spring Creek. Mr. John Borgh is manager of the company.

GALLATIN COUNTY.

Chestnut Coal Company This property was first located by Colonel James D. Chestnut in 1867, after whom the coal was named. In the early days it is stated that coal mined at this point was hauled as far as Helena by ox teams. The property was finally acquired by the Union Pacific Railway Company in the nature of an investment. About fifteen years ago J. C. McCarthy and James A. Johnson secured a lease and developed and operated the property up to the time of its purchase by the Northern Pacific Railway Company in the summer of 1902. The Northern Pacific company also acquired the property of the Mountainside Coal Company, an adjoining property which was opened up by M. J. Johnson and associates during the years

1900 and 1901. The coal opened at Chestnut belongs to the Yellowstone river field. There are several beds of coal in this district, but only one is worked. The vein which has been developed varies from five to about twenty feet in width and the dip varies from twenty-five to ninety degrees. The vein is very dirty, being composed of alternating bands of coal, bony coal, bone and shale, the proportions of which vary greatly and abruptly. Messrs. Johnson and McCarthy drove a tunnel in a northeasterly direction 700 feet long to cut the coal. They then drifted on the vein about a mile, which drift has a northwesterly direction. This vein they stoped out from the tunnel level to the surface a distance of from four to 700 feet. Manways and chutes were maintained from the tunnel level to the working face, the dirt and poorer coal being gobbed below.

In 1898 and 1899 a Campbell washer was erected on the property and up to the date of the sale of the property to the Northern Pacific Railway Company, the output of the mine was maintained by the washing of the gob drawn from the old workings. Under their management a shaft was also sunk on the vein from the tunnel level to a depth of 300 feet and some drifting done at the 300-foot level under the old workings.

Under the management of the property by the new company, large and expensive improvements have been made the past two years. H. J. Horn is manager of the property, Robert Pettigrew has general supervision of the company's coal properties in Montana, and T. J. Evans is locally in charge as superintendent. The output for the year 1903 was 43,224 tons and the estimated output for the year 1904 is 50 per cent greater. A large amount of coal is in sight and with present developments which are under way, completed, an output of from 500 to 1,000 tons per day will be maintained. During the year 1903, the plant was increased by additional boilers and a compressor plant, air replaced steam as a motive power for the hoisting engine, which is located inside of the mine. The large washing plant which was destroyed last October by fire has been rebuilt.

The tunnel and shaft at Chestnut is about 3,000 feet from the Mountainside workings. The vein, which is nearly perpendicular at Chestnut, inclines from 90 degrees going towards the mountainside, until half way between the workings, where it is again perpendicular. From this point it again inclines from the

perpendicular, the pitch of the vein varying much in the Mountainside workings. A water level drift, connecting the workings of the two mines, has been completed. A main slope is being sunk at Mountainside and is now over 500 feet long. The vein is much distorted and faulted at Mountainside, the strike varying from north and south to east and west.

The coal produced, when washed, makes an excellent steam coal. A large proportion of the output has been used and will be used for local fuel on the Northern Pacific Railroad.

Many new houses have been erected by the company and this camp will become one of the best and most thriving camps in the state.

Storrs—The property at this place, owned by the Amalgamated Copper Company, was practically closed down during the summer of 1904. One of the most modern and complete plants in the United States was completed on this property. The plant consists of a large Luehring washer, 100 completed and 100 uncompleted coke ovens, a large store and hotel, an electric light plant and water system; also a large number of substantial houses for emplayes.

PARK COUNTY.

The Montana Coal and Coke Company—Henry G. Merry is manager and J. F. Kent is superintendent of this property. This property is the principal source of coke in Park county and in fact, in the state. The present market is the Montana smelters, but the company is not dependent upon this market, as was shown by the period of shut down of the Amalgmated Company in the fall of 1903, when a market for all their supply was found in the Utah smelters. The main workings are in one of the four workable beds found in this Cinnabar field. The field is much faulted and the coal has all been highly altered by the eruptive rocks of Electric Peak. The plant and mines are located at Electric and Aldridge respectively. Electric is located on the Park branch of the Northern Pacific railroad, 50 miles south of Livingston. The field tributary to the present workings lies between Mulherin creek and the Yellowstone river and comprises an area of several square miles. The mines, which are located at Aldridge, are nearly three miles distant from Electric by wagon road. The company has built a tramway from Electric to the top of the mountain, nearly a mile long, the grade being

as high as 43 per cent. The car is pulled up the slope by an electric hoist and serves to convey both people and supplies from the town to the mine. At the top of this plane there is a trolley line which runs to the store and mines.

The ovens are 250 in number and a coke extractor is used to pull the ovens. The coke is loaded into small cars by the coke extractor and then is hoisted by a small motor to a bin, from which it can be automatically loaded into box cars for shipment. The washer is located below the tipple at the mine. Until this washer was completed the coke produced was of an inferior quality. The method of conveying the washed coal from the washer to the bunkers, over two miles, is not used to the writer's knowledge, at any other mine. It is carried by water in sluice boxes to large bunkers near the coke ovens, where it is dried by steam. The steam used is the exhaust steam from the electric plant, which is also used to heat the company's buildings at Electric. The water for the washer is carried by a new water line recently constructed several miles in length.

The power plant is equipped with four 150 H. P. boilers, two 500 volt generators and an 800-light dynamo. Under the present management there have also been made many improvements in the mine.

The slope of the company is down about 700 feet. Four entries have been driven, known as No. 1, the main entry; No. 2, and No. 4. No. 1 has been driven about one mile. The main entry is one and one-quarter miles in length; No. 2 is over four thousand feet long. No, 4 is now about three thousand feet long. An electric motor hauls the cars in the main entry to the tipple.

The haulage and airways have been much improved, making the ventilation much different from what it formerally was.

Cokedale Coal and Coke Company—The mines of this company are located at Cokedale, about nine miles west from Livingston and are reached by a short branch of the Northern Pacific Railroad. The mine was formerly quite a producer, but work was stopped for eight years. The work of unwatering was commenced in May, 1903, and completed October, 1903. Geo. H. Hill is manager of the property and Thomas Good, Superintendent. Much development work has been done during the past year. The 100 coke ovens have been repaired and the necessary buildings needed in such an operation have been built. The

recent developments consist of an air shaft, fan house and fan, West entry driven 1,785 feet, air way 1,785 feet, slope has been sunk from No. 5 to No. 6 (300 feet), air way connection from No. 5 to No. 6, cross cut North 130 feet, South 140 feet, East prospect entry driven 200 feet, diamond drill hole 240 feet which cut a new vein of coal, an entry driven 260 feet on new vein, and a new air shaft sunk from surface to No. 4, parallel with slope. The development done in the 5th level has proven that the vein is permanent in character and that the coal is of good coking quality. No shipments have been made, only enough coal being mined for steam purposes. Sufficient narrow work has been completed and enough rooms opened up to develop coal sufficient to keep the ovens running without interruption. There have been no fatal accidents during the past two years.

GRIEVANCES.

During the past year the Inspector has had his attention brought to but two matters by any of the coal miners of the State. The first matter, regarding the Red Lodge Mine, was brought up by letters sent him by the Secretary of the Red Lodge Miners' Union, dated February 22, 1904, and March 7, 1904, respectively. He went to Red Lodge and met a committee of miners who made a general complaint of the ventilation of the entire mine. The report on the conditions as found is added to this report. It is but fair to state that a certain portion of the mine had been squeezing for some months—completely closing one entry and air course. It was absolutely necessary to reopen this portion of the mine to save the entire workings. This was done at great expense to the Company. During the progress of this special and imperative work ,it was necessary that men should work in this portion of the mine where the air was bad. The workings which were then closed up are now reopened and the trouble over.

Special Report to Governor.

Office Inspector Coal Mines, Helena, March 18, 1904.
Hon. J. K. Toole, Helena, Montana:

Sir: Having received communication from the Miners' Union of Red Lodge, stating that they had grievances and demanding an immediate investigation, I recently went to Red Lodge and met the Executive Committee; after a conference with them they stated the grievance of the men to me in writing. Their complaint was a general one, relating to the ventilation of practically the entire workings of the mines of the Rocky Fork Coal Company.

As the complaints were of such a serious character, I made a most complete and exhaustive inspection of the property in question, and I take pleasure in handing to you the results of my inspection, so that if the matter should be brought to your attention at some future time, you will be fully acquainted with the facts in the case.

The mines at Red Lodge are owned and operated by the Northwestern Improvement Company, a subsiduary company of the Northern Pacific Railway Company. At the present time and during the past year, Mr. H. J. Horn, has been General Manager of the Company and Robert Pettigrew has been General Superintendent.

Five veins on the property, known as No. 1, No. 2, No. 4. No. 5 and No. 6, are developed by two main working slopes known as No. 2 slope, which is driven in No. 2 vein and is 1,800 feet long, and No. 4 slope, which is driven in No. 4 vein and which is 2,000 feet long. There are three intakes and two outlets.

The Laws of the State of Montana regarding the ventilation of coal mines are embraced in Section No. 3355 of the Political Code of Montana which states, "The owner or operator of every coal mine, whether operated by shaft, slope or drift, must provide and maintain for every such mine a good and sufficient amount of ventilation for men and animals employed therein; the amount of air in circulation to be in no case less than one hundred cubic feet for each man, and six hundred cubic feet

for each animal per minute, measured at the foot of the downcast, and the same to be increased at the discretion of the inspector according to the character and extent of the workings, or to the amount of powder used in blasting, and the volume of air must be forced and circulated to the face of every working place throughout the mine, so that the mine is free from standing powder smoke or gases of every kind. All doors set on main entries for the purpose of conducting ventilations must be so constructed and hung as to close for themselves when opened, and must be made sufficiently tight to effectually obstruct the air currents."

I first measured the exhaust air from the mines and the results were as follows:

In No. 2 slope I found the velocity of the air to be 750 feet per minute and the area to be 13 feetx16 feet, or a total area of 78 feet, this gave a total amount of 58,500 cubic feet of air being exhausted through this slope per minute. In the manway, which is the secnd outlet for the air from the mine, I found the velocity to be 770 feet per minute and the area to be 6 feet by 4.66 feet or a total area of 28 square feet. This gave a total exhaust of 21,560 cubic feet of air per minute from the manway; it is thus seen that the total outlet of air from the mine per minute amounts to 80,060 cubic feet per minute.

The intake air, which consists of five separate and distinct currents, I found to be as follows:

"2nd West," 19,440
"5th East," 9,695
"4th West," 9,975
"No. 2 Mine," 25,740
"No. 6," 15,750

which gives a total of 80,600 cubic feet of air going into the mine per minute. As the total amount of air going into the mine almost checks exactly with the amount of air coming from the mine, it proves that the measurements were carefully taken and are correct.

I will now take up these several splits, and show how my figures were deduced and also state the number of men working on these different circuits.

I measured the return air on the 2nd West and found the velocity to be 240 feet per minute and the total area of the air way to be 81 square feet. This gave a total of 19,440 cubic feet

of air per minute. This air returns from the 3rd West which is not being worked. On this circuit there are 14 rooms and two entries being developed and there are 46 men working, 4 mules and three drivers. At the face of the entry, I found that there was a cross-cut within 40 feet, and that the air was good. The measurements taken of the intake air at the 5th East, gave a velocity of 235 feet per minute, an area of 9½ feet by 4½ feet, or 41 square feet and a total amount of 9,695 cubic feet per minute. On this circuit there are 57 men, 2 mules and two drivers working.

The air on the next circuit which I will take up, is forced down No. 2 slope, which is 1,800 feet long, by a 20-foot fan. The bottom of this slope is connected with vein No. 1, by a tunnel driven South 300 feet long. This slope is also connected by a rock tunner 700 feet long, driven North to the 4th, East level on the North 4, vein. The measurements of this air gave a velocity of 330 cubic feet per minute, an area of 78 square feet and a total volume of 25,740 cubic feet per minute.

There are two short levels in about 500 feet each that are being driven West to show up the quality of coal and the general conditions of the roof and floor.

Past experiences on this vein have been very discouraging on account of a heaving floor and soft roof. On the two levels 18 miners, 1 driver and 1 mule are at work. The air was good except at the face, which was due to the fact that the cross-cuts were some distance from the face of the entries.

In No. 1, vein there are two entries; the East entry was abandoned the 17th of March, on account of the poor quality of coal and the bad floor. On this level there are 28 miners, 3 drivers and 3 mules at work.

The air at the face of the West entry was fairly good and the miners working at that point stated to me that they had no fault to find with their working conditions.

The 4th East entry on No. 4 vein is idle on account of the floor heaving and only a few company men are at work where a large volume of air is passing through.

Some development work is being done on the No. 5 vein, which is located on a tunnel North from the 4th Entry on No. 4 vein. On this entry there were 18 miners, 1 driver and 1 mule at work; the air at this point was excellent and fully double the amount required by law. The measurements of the No. 6, air taken

on the 3rd East, which air supplies both the 6th East and 3rd East, gave a total volume of 15,750 cubic feet per minute. On this circuit there are 76 men and three mules at work.

During the last 12 minths, the Northwestern Improvement Company have driven 4,500 feet of rock tunnels and 4,000 feet of entry work in the development of new veins. This work has been done principally to block out No. 5 vein and put it in shape for extensive operations. This work consists of nearly 4,000 feet of rock tunnel to tap No. 5 vein on Water Level and 2,000 feet entry work. On the same vein 1,100 feet to the dip, an entry has been driven 1,000 feet and is still being pushed by double shift. An air-way has been carried along with the entry making a total of 2,000 feet of narrow work.

North from this lower level there are two slope rooms being driven up to connect the water level.

On the 4th East of No. 4 vein, about 500 feet from No. 4 slope, a tunnel has been driven North to tap No. 5 vein; this tunnel which is 580 feet long, is driven with a parallel air-way, makes a total of 1,160 feet of rock work. At this point entries and air ways are being driven East and West. At the present time there are about 2,000 feet entry work completed and four rooms are being pushed up to complete connections with the workings above o nthe same vein.

When this work is completed there will be a continuous outlet from the lowest levels on No.4 vein to the surface through the new slope on No. 5 vein. Slope No. 1, which is being driven from the 4th West entry is now up about 1,400 feet and a parallel air way is also being driven the same distance, this work will finally connect with the slope which is being driven from the surface and will, when completed, give an independent circuit and outlet for the workings of the No. 1 vein, and in fact a continuous outlet from the lowest workings of all veins to the surface through the No. 1 vein; there remains but a distance of 300 feet to be driven before this work will be completed, which will take about three months.

It is thus seen that when No. 1 and No. 2, are completed, the mines at Red Lodge will have the following means of ingress and egress:

1st, a double outlet consisting of an air way and slope on the No. 4 vein.

2nd, a slope outlet on the No. 2 vein.

3rd, a slope outlet on No. 5 vein.
4th, a slope outlet on No. 1 vein.
5th, an outlet on No. 6 vein from 3rd East to surface.

To summarize the general results of my inspection, I may state that in the mines of this Company, which are at the present time employing about 300 men working inside of the mine and 50 men outside of the mine, which is about 100 men less than have been previously at work, that the company is supplying about 50 per cent more air to the men than is required by law. That all of the general conditions of the mining operations including timbering and ventilation, are in good shape. That the Company are pushing a large amount of development work, which when completed will greatly improve the present conditions of the air in the mines and by providing additional means of ingress and egress for the miners will greatly facilitate their getting out of the mine in case any extraordinary conditions should arise.

Very respectfully submitted,
HOWARD F. WELSH.

CHECK WEIGHMAN DISPUTE.

As this dispute between the miners of Red Lodge and the Company was the cause of a strike and consequent negotiations, the action of this office in the matter will be put on record.

The Inspector received a wire the evening of April 6th, from the Manager of the Cottonwood Coal Company, stating that a miner had been killed at 6:45 P. M. of that date. He wired a reply and left at midnight, arriving at Stockett the morning of the 7th, and made an investigation as to the cause of the fatality. Returning to Helena on the 12th, he found a telegram dated Red Lodge, April 9th, and signed M. F. Purcell, asking him to come to Red Lodge at once. The sender was unknown by the Inspector. On the 12th, a letter dated Red Lodge, April 11th, was received and was sent by the same person which intimated that there was some difficulty between the employes and the company over the check weighman, and that the Inspector's services were demanded in the settlement of the dispute. Particulars were requested. In the meantim a telegram dated April 14th, signed "Montana Coal and Coke Company" stating that a miner had been killed on the night of the 13th, was re-

ceived and the Inspector immediately proceeded to Horr. In the papers some of the particulars of the trouble were learned. Upon returning to Helena from Horr, another wire was received dated Red Lodge, April 18th, signed M. F. Purcell, stating that the sender would arrive in Helena on the 20th. An interview took place on that date between the Inspector and the Committee. Again the facts were asked for and on the 23rd, charges were given the Inspector in detail by M. F. Purcell, the District President of the U. M. W. of A. The same day the Inspector forwarded the charges to the County Attorney of Carbon County, with a request that he should prosecute the Superintendent of the County for not allowing the check weighman elected by the Red Lodge Miners' Union to act in that capacity, on behalf of his office if such an action was warranted. The County Attorney replied that he saw no sufficient cause to bring a criminal action against the Superintendent. The Inspector then turned over the written charges given him to the Attorney General of the State. Under action taken by the Attorney General, the Superintendent of the Red Lodge Mines was arrested on May 23rd, on a warrant sworn out before Justice David Hawthorne by Nathan Smethurst and the case was set for trial June 1st. The State was represented by Geo. Y. Patton, second assistant Attorney General, and on the afternoon of June 2nd, a jury brought in a verdit of "not guilty."

The result of the negotiations between the Committee and the representative of the Company was as follows. After several conferences the following agreement was reached:

"Referring to attached memoranda—stenographer's report of conversation held in Helena hotel to-day—we agree to the following proposition, matter to be handled as follows:

"Mr. Horn's position as referee, as stated in attached papers, conversation on the subject as taken down by the stenographer, and any other statements that we may wish to make as to the facts connected with previous condition—sections 16 and 17—together with our arguments, to be submitted to the national board of the United Mine Workers of America, they to decide the questions as proposed in this referee's statement, the coal department of the Northwestern Improvement company to accept the rulings of the national board; the men, the district and the local, to also accept the rulings.

"In the meantime the Smethurst matter is to be held in abey-

ance. If the decision of the national board is that the coal department was attempting to introduce a new condition and that Smethurst is not entitled to be check weighman, the coal company, the men of the local and the district will also accept this ruling. In any event, regardless of the ruling of the national board, the coal company will pay Smethurst at the rate of $100 a month from Tuesday, April 19, 1904, until decision has been reached; or, in the event of no decision being reached, until the life of this agreement expires September 30, 1904.

"We also agree that there shall be no cessation of work, that the mine shall run, and that Smethurst shall not be employed as check weighman until such decision is reached."

The agreement was signed by the district executive board and by Mr. Horn.

Mr. Horn's Statement.

"As one of the referees under the Helena agreement, after consideration of the matter at issue with my co-referee, M. F. Purcell, I state my position as follows: The question of difference is: Whether or not one Smethurst shall be received and suffered to act as check weighman at the mines of the Northwstern Improvement company, at Red Lodge.

"As I understand it, the following are the facts material: In September last, at Helena, Mont., the Northwestern Improvement company, through Horn, then and now general manager of the coal department, as one party, and the national organization of United Mine Workers of America, through Burke, its national board member, and the district union No. 22 of the United Mine Workers of America, through Purcell its president, as the other parties, entered into the so-called Helena agreement, which was to continue in effect for one year, expiring Oct. 1, 1904.

Miners and Laborers.

"Then and at all times since there were and now are employed at the mines both miners and other laborers, not over five-sixths of whom were members of this district union, while the remainder of those employes were not such members. The company employes consist not only of miners, but as well of dumpers, loaders, firemen, engineers, drivers, teamsters, oilers, trappers, motormen, laborers, inside company men, etc., all of whom were and are paid by day wages, having no possible interest in the tonnage of coal mined, save the 'miners,' who were paid a fixed

price per ton for coal mined by each. The local union, itself a member of the district union, had and has a membership made up partly of the miners and the various other classes of employes in the employ of the company, and partly of other persons, who had and have no employ of any kind with the company.

"At the time of the making of the agreement a check weighman was at work in the mines, who had been chosen from among the company employes. Sections 16 and 17 of the Helena agreement provide:

"Sec. 16. 'No local shall be allowed to make any new conditions which conflict with the terms of this agreement.'"

"Sec. 17. 'Prices and conditions not mentioned to remain the same.'"

"On March 25, 1904, the local union undertook to elect one Smethurst check weighman at the mines for the three months succeeding April 1. In this election there participated and acted only such miners in the employ of the company as were members of the union. There was no meeting of the miners in the employ of the company, as such, for the purpose of electing a check weighman and no oportunity afforded the one-sixth of the miners then in the company's employ, who were not members of the union to act or vote in the slection of a check weighman. There also participated in this attempted election union members who were not in the employ of the company as well as union members belonging to the various other classes of labor in the employ of the company as above enumerated. Smethurst, the man so mentioned, was not and has not been for some time a company employe, having been last employed at other coal camps. On March 26 the executive committee of the union was notified that Smethurst would not be allowed to act in the weighroom.

Employment of Smethurst.

"April 1, James Allison, a union member, then a miner employe of the company, qualified as check weighman and served until the evening of April 8. On the morning of the 9th Smethurst, without further action or notification, took possession of the weighroom of the company. On April 11, a committee of the union informed the company superintendent that the union employes would quit work unless Smethurst was allowed to act. They did so. Subsequently the union men returned to work, and are now at work at the mines; and this question of the right of Smethurst to work has been referred under para-

graph B of Section 6 to Messrs. Horn and Purcell for adjustment, if possible—that clause of the agreement, so far as applicable, providing that the matter of disagreement 'shall be referred to the superintendent of the company and the president of the local union, or such person as he may designate to represent him; and should they fail to agree it shall be referred to the manager of the company and the district president of the United Mine Workers' Union of America, for adjustment; and in all cases the mines, miners, mine laborers and parties involved must continue at work pending an investigation and adjustment, until a final decision is reached in the manner above set forth.'

"The constitution of the district union, Article V, provides:

" 'Sec. 1. When trouble of a local character arises between members of a local union and their employers, the officers of said local shall endeavor to effect an amicable adjustment, and failing in this they shall immediately notify the officers of the district, and said district officers shall immediately investigate the cause of complaint; and failing to effect a peaceable settlement on a basis that would be fair and just to aggrieved members, finding that a strike would best serve the interests of the locality affected, they may order the inauguration of a strike; but no local strike shall be legalized or supported by a district unless its inauguration was approved by the officers of the district and by the national president or executive board, upon an appeal taken by the aggrieved members from the decision of the district officers.'

" 'Sec. 2. Before final action is taken by any district upon questions that directly or indirectly affect the interests of the mine workers of another district, or that require a strike to determine, the president shall jointly prepare, sign and forward to the national president a written statement setting forth the grievance complained of, the action contemplated by the district, together with the reasons therefor, and the national president shall, within five days after the receipt of such statement, either approve or disapprove of the action contemplated by the aggrieved district and such approval or disapproval, together with the reasons therefor, shall be made in writing, and a copy forwarded to the secretary of the complaining district. Should the action contemplated by the aggrieved district receive the approval of the national president, the district shall be free to act, but should the national president disapprove the action contemplated, the

district may appeal to the national executive board, which shall be convened to consider such appeal within five days after its receipt by the national secretary. Until the national president has approved, or the national executive board has sustained the appeal, no district shall be free to enter upon a strike unless it shall have been ordered by a national convention.' And similar provisions appear in the national constitution.

Check Weighman Law.

"A law of Montana, found on page 65 of the laws of 1901, declares: 'That miners employed by or engaged in working for any mine in this state, shall have the privilege if they desire of employing, at their own expense ,a check weighman, etc.'

"I claim, first, that the law of Montana above quoted does not pretend to confer the right or privilege of selecting a check weighman on any save the miners in the employ of the company, i. e., those who are interested in the weights because paid for their labor by tonnage weight of coal mined. It has not pretended to confer such a right either on the employe dumpers, loaders, firemen, engineers, drivers, teamsters, oilers, trappers, motormen, laborers, inside company men, who are paid by the day and have no interest in the tonnage mined; not to confer such rights on non-employes, whether miners or not, who happen to be members of a union; nor in any union itself as such. I am informed that such a power could not have been conferred by a law on unions, or on non-employes, or on other employes than those directly interested by reason of their mode of payment in the tonnage weight of coal mined. Very clearly there was no attempt to do it in this law.

"Second—Whatever rights this union has, then, in the matter of the selection of a check weighman, must come from the agreement, and not at all from the law. Without the agreement the union would have no right at all in the premises. It may be conceded that there are many individual members of the union, who, as miner employes of the company, would be entitled in the absence of an agreement—in common with all other miners of the company, not members of the union—to exercise any privilege given them by the law. But with such individual rights this referee can have nothing to do. It is concerned only with the rights of the union, as such. Moreover, the rights of the miner employes being mere privileges, conferred by the statute, are subject to waiver, and—as to the five-sixths of the miners

who are members of the union which was a party to this agreement—have been waived by the agreement, as will be explained later.

"Third—Nowhere in the Helena agreement is there an express provision giving the union or its members who are miner employes of the company the right to select a check weighman. This power, if granted at all by the agreement, must be by force of the sixteenth and seventeenth sections of the agreement above quoted, and also because there was as a part of the conditions existing at the mine at the time the agreement was entered into, a check weighman, elected by it, then performing such functions. But as has already been seen the check weighman then acting was an employe of the company at the time of his selection. The selection by the union, now, therefore, of a person not an employe of the company would be contrary to the conditions existing in that regard when the agreement was made, and therefore not an implied power, granted the union by the agreement, and would be a change in conditions which would amount to a violation of the Helena agreement.

"Fourth—That the conditions existing at the date of the agreement as to the check weighman being a miner employe was not a fortutous or accidental one is evidenced by the fact that it is the universal custom among coal mines that he should be selected from among employes of that mine. So far as I can learn, there has been no departure from that custom at this mine. Regardless of this, however, so far as the agreement and the rights of the union under it are concerned, the conditions existing on the date it was made must prevail.

Can Waive Their Rights.

"Fifth—It is settled that no right or privilege given any person or set of persons by statute for their personal benefit may be waived by them. A provision of the civil code of Montana applicable to the great body of the law in that act defining rights and duties of persons declares—Section 4240: 'The benefit thereof may be waived by any party entitled thereto unless such waiver would be against public policy.' This right of waiver exists independent of the above quoted act, and is subject to only one prohibition found in Section 15, Article 4 of the State Constitution, which in substance prohibits employes from making any contract whereby they waive their right to claim damages for future personal injuries. This prohibition is immaterial here.

"That the law of 1901 confers a privilege on miners which they may or may not exercise follows from the very language of the law itself. It declares: "The miners * * * shall have the privileges, if they desire of employing," etc.

Had this agreement been with the company employe miners as such instead of with the union and had they agreed therein to select a check-weighman from among themselves the vitality of such an agreement could not be questioned. Here five-sixths of the company miner employes acting through their authorized representatives in the Helena agreement, agreed that the existing conditions—among other respects in regard to the check-weighman—should prevail during the life of that agreement. They may not rightfully during its life do any act in contravention thereof, either individually or in concert with other miner employes, or any other person. The selection of Smethurst is such an act because it would have the effect of changing a condition existing at the date of the Helena agreement and therefore is a violation thereof.

"Sixth—Because my co-referee, under the agreement, M. F. Purcell, is unable to accede to this view, holding a difference between us, and because thereof, by force of the agreement and by force of the district union's constitutiton and the constitution of the national union in that regard I insist that work cannot cease at the mines until the national president or the executive board of the national union determines the question of difference between myself and Mr. Purcell as referees.

To Maintain Agreement.

"Seventh—It is evident that the management of the coal department is extremely anxious to maintain absolutely the Helena agreement. It is also evident that the management of the coal department is willing and anxious to keep the mine in continual operation, is anxious to be fair and just with its employes. As an evidence of this last the management is willing and anxious to collect evidence upon the issue as to whether the local was attempting to impose new conditions against the Helena agreement and refer the matter to the national board of the United Mine Workers of America at Indianapolis, which the newspapers state meets in a few days. It is also evident that the management of the coal department is willing to leave the decision to the national board, and accept whatever ruling the national board may make on the interpretation of clauses 16 and

17 of the Helena agreement, and desires a ruling of the national board as to the bearing of the national constitution and the district constitution and the Helena agreement, which the management of the coal department understands is a part of the Helena agreement."

This agreement and statement of facts was presented to Mr. John Mitchell, the President of the National Organization of the United Mine Workers of America, and his decision was rendered in a letter received by the Superintendent of the Coal Company on May 27 Mr. Mitchell held that

1st. The Miners must elect a checkweighman from among the employees of the Company.

2nd. That only men actually employed as miners shall have a vote in the election of a checkweighman hereafter.

3rd. That the checkweighman elected by the Red Lodge Miners' Union, Nathan Smethurst was entitled to no recognition from the Company, as he was a non-employee of the Company at the time of his election.

LIST OF LARGER OPERATIONS—1903.

NAME OF COMHANY	Address	Manrger	Superintendent	Output Tons of Coal.	Number of days Mine Worked	Number of Miners Employed	Number of inside Men	Number of Outside Men	Number of Machines.
Anaconda Copper Mining Co	Belt	F. W. C. Whyte	J. J. Kinney	184,686	187	240	131	64	22
Anaconda Copper Mining Co	Storrs	F. W. C. Whyte	G. N. Griffin	*	59	106	22	99	0
Cottonwood Coal Co	Stockett	Lewis Stockett	James Pierson	401,022	302	191	93	79	34
Gebo Coal Co	Gebo	H. H. Griffith	J. E. McLaughlin ...	2,000	40½	12	12	9	4
Nelson Coal Co	Sand Coule	A. O. Nelson	John Pierce	56,310	212	**54	.....	12	0
Northwestern Improvement Co	Red Lodge	H. J. Horn	Robert Pettigrew ...	541,050	301	430	70	75	4
Northwestern Improvement Co	Chestnut	H. J. Horn	T. J. Evans	43,224	201	100	25	70	0
Bridger Coal Co	Bridger	Geo. Hough	W. R. Dickson	50,000	235	33	28	18	7
Montana Coal & Coke Co	Electric	Henry G. Merry	J. F. Kent	117,150	.....	.....	.....	.....	0
Rock Springs Coal Co.....	Sand Coule	Ed. Gerber	.....	104,800	300	85	72	13	8
Cokedale Coal & Coke Co	Cokedale	Geo. Hill	Tom Good	6,000	200	***	.....	.....	0
1904									
Anaconda Copper Mining Co	Belt	F. W. C. Whyte	J. J. Kinney	142,783	228	175	95	61	22
Anaconda Copper Mining Co	Storrs	F. W. C. Whyte	G. N. Griffin	****	198	125	21	94	0
Cottonwood Coal Co	Stockett	Lewis Stockett	James Pierson	400,000	300	235	76	126	34
Gebo Coal Co	Gebo	H. H. Griffith	J. E. McLaughlin ..	25,000	260	22	21	9	4
Nelson Coal Co	Sand Coule	A. O. Nelson	John Pierce	116,898	250	**94	.....	10	8
Northwestern Improvement Co	Red Lodge	H. J. Horn	Robt. Pettigrew	478,000	260	407	64	72	4
Northwestern Improvement Co	Chestnut	H. J. Horn	T. J. Evans	61,617	283	110	29	50	0
Bridger Coal Co N.....	Bridger	Geo. Hough	W. R. Dickson	50,000	220	34	25	18	7
Montana Coal & Coke Co	Electric	Henry G. Merry	J. F. Kent	78,000	******	.....	.....	.....	0
Rock Springs Coal Co	Sand Coule	Ed. Gerber	.....	75,000	276	83	70	13	8
Cokedale Coal & Coke Co	Cokedale	Geo. Hill	Tom Good	6,000	300	***	.....	.....	0

* Coal, 8,196; Coke, 1,000
** Total inside.
*** Total employes, 75.
**** Coal, 38906; Coke, 6,793.
***** Not operated since August.

Accidents, 1904.

CARBON COUNTY.

Northwestern Improvement Company, Red Lodge.

1904.

January 11—Wm. J. Ellwood, fire boss; married; was slightly burned about face and hands. He ignited a small amount of fire-damp in Room 24, 4th West, No. 4 vein.

February 8—Jacob Blom, miner, married; was fatally injured at face of No. 6 Entry; a piece of rock loosened by a shot fired the day previous caused the injuries which later resulted in his death.

February 17—Matt A. Neimi had a leg broken by being struck with slope rope. Instead of taking regular traveling road, he was walking along on haulage road.

March 14—John Walsh, driver, single, had small bone in leg broken; he was riding on front end of trip and cars ran into the mule; his leg got between the car and mule.

March 28—Wm. Richardson, driver, fell in front of trip coming out of No. 1 Mine. Painful bruises; no bones broken.

April 21—James Fleming, motorman, had arm broken by piece of flying coal from a runaway trip on No. 2 slope.

May 10—Henry Collins, miner, married, was fatally injured in Room 9, No. 5 Water Level. He went under some coal loosened by a shot fired by himself the day previous.

May 29—Robert Anderson, company work, had his foot crushed by a piece of rock falling on it. He was engaged in taking this rock down, and when it came down he was unable to get out of the way.

June 8—John Johnson, miner, had both legs broken by a fall of coal in Room 4, 4th West, No. 4 vein.

June 17—John Jokkila, miner, single; was instantly killed in Room 63, 2d West, No. 4 vein. A small piece of coal fell from the roof, striking him on the head.

June 28—Oskar Neimoen, miner, single; was seriously injured in Room 9, No. 5 Water Level. Accident was similar to when Collins was killed, and Neimonen was working with Collins when killed.

July 5—Andrew Korbach was instantly killed while riding in on a car to work on 4th East No. 4 vein. Car jumped the

track, knocking a timber out. Some rock fell, killing Korback instantly.

Bridger Coal Company.

1904.

March 15—Frank Zeawadzki was hurt in back of head, leg and back by falling rock.

CASCADE COUNTY.

Rock Springs Coal Company.

March 13—Math. Korpi, hurt by fall of rock.

May —Math. Fultman, killed by fall of rock.

August 15—A. H. Hoagland, hurt by fall of rock.

August 27—F. Henrickson, hurt by fall of rock.

September 15—L. Aranon, hurt by fall of rock.

Cottonwood Coal Company—Stockett.

January 12—Jno. Bufto, loader, fractured thigh; machine upset on him.

February 15—Adam Matscko, driver, ribs broken attempting to jump on trip.

March 6—Chas. Knoskey, driver, foot mashed, caught by trip.

April 6—Andrew Plavison, killed; skull crushed by falling slate.

July 2—William Kerr, switchman, killed; run over by trip.

August 15—Jno. Preston, left leg broken by shot through a pillar.

Nelson Coal Company.

April 28—Joel Pepo, injured by fall of rock in entry; died from injuries to back on July 22, 1904.

GALLATIN COUNTY.

Northwestern Improvement Company—Chestnut.

August 8—Jno. Collet, miner, right foot broken by sliding timbers.

October 28—F. B. McKiernan, trapper, had simple fracture of left leg caused by trying to remove a board from a car while trip was in motion.

Amalgamated Copper Company—Storrs.

January 16—Peter Cools, laborer. He was bucking coal in the chute when the men on top dumped a car which he failed to notice. The coal struck him and knocked him out of the chute, which caused scalp wounds and slight bruises on chest and legs.

January 20—Geo. A. Burt, miner; was undermining at face of room No. 22, No. 3 mine, when some coal fell on him, breaking his collar bone.

February 9—Arthur Griffin, helper. He was threading bolts on machine when his clothing caught in same, pulling his right shoulder out of joint.

March 26—Chas. Hanson, miner. Was standing on platform at bulkhead in room No. 19, No. 3 mine, when his partner, who was 7 or 8 feet above him in the manway, knocked off a piece of coal which struck him on hte left side, fracturing one of his ribs.

March 29—Wm. Brown, driver; was bringing a loaded car from No. 1 mine to the tipple and only put in one sprag. While trying to get his horse out of the way he fell with his left hand on the rail; the car passed over it and the small finger was badly smashed and had to be amputated.

March 29—G. P. Morris, tippleman. He was trying to throw the belt off the pulley that turns the car haul with a crowbar; the bar caught in the pulley and struck the end of his left big toe, bruising same.

March 31—Eli Bigovitch, laborer. He went in the mine to meet the driver, who was coming out with a loaded car and was caught between the car and the timbers. Slight bruised about the body.

April 15—John Lindli, laborer. Was sliding down the chute when a man on top dumped a car of coal. The coal knocked him down and bruised his legs.

April 19—Pat Corcoran, driver. Was coming out of main entry No. 3 mine with loaded trip and failed to use sufficient sprags; trip jumped the track and the thumb of his right hand was caught between the end of a car and a prop. Thumb was crushed badly and the end taken off.

May 3—J. LeBrun, Sr., timberman. Was riding on car in No. 3 main entry and struck his hand against a timber, spraining the wrist.

May 7—Mike Fornick, miner. Was undermining in room No. 40, No. 3 mine, when the coal fell on him, breaking his left leg.

PARK COUNTY.

Cokedale Coal and Coke Company.

Frank Willis, burned by gas twice during the year.

Montana Coal and Coke Company.

April 13—Anton Plenesheck, killed in room of old mine by fall of roof.

There were a total of nine fatal accidents in the coal mines of the state from January 1st, 1904, up to the time this report goes to press, Nov. 30th, 1904. During the Inspector's teerm of office, which has been four years, there have been a total of thirty-three fatal accidents, which are subdivided as follows:

	1901	1902	1903	1904	Total
Falls or rock or coal.....	4	10	4	8	26
Trips	1	1	1	1	4
Miscellaneous	2	1	0	0	3
Totals	7	12	5	9	33

In order to make an absolutely correct comparison of the fatalities which have occurred in Montana with the other states of the Union and the other fields of the world, it is necessary to have the absolute number of men who have been engaged in coal mining in Montana during the past four years. It has been impossible to ascertain the average number of employes engaged during this period as accurately as has been done in some of the older states. One of the reasons for this is owing to the neglect of some of the managers, especially those in charge of smaller operations, to give the data requested by the Inspector, which was necessary to make the records accurate and complete. The Inspector desires to thank many of the managers for their courtesies extended him during the past four years, and those in charge of their underground operations, especially those whose names are given in the list preceding this chapter. Another reason for it being difficult to get the exact average number of employes is owing to the fact that many of the smaller operations are practically idle during the summer months. The main reason, however, is because these past four years have been a period of a great many changes taking place in the way of improvements and the development of small properties to a scale of considerable magnitude.

One example of this is the Chesnut property of the Northwestern Improvement Company, which was acquired in 1902. The following table shows how that operation has grown:

	No. of days In operation	No. of miners employed	No. of inside men	No. of outside men
1902.				
Minimum	94	37	12	22
Maximum	94	66	25	55
1903.				
Minimum	201	75	25	37
Maximum	201	120	25	97
1904.				
Minimum	283	77	25	34
Maximum	283	143	33	64

A careful computation of the average total number of men engaged in the coal industry of the state for four years gives a result of 2,500 men. The number of persons killed per thousand employed is thus seen to be: 1901—2.80; 1902—4.00; 1903—2.00; 1904—3.60, or an average for the four years of 3.10. The average number killed per thousand for the years 1903 and 1904 is 2.80, compared with 3.40 for the years 1901 and 1902, which is a decrease of .60.

It is thus seen that the total fatalities per thousand employed in Montana for the past four years has been 3.10, as compared with 2.87, which is the average fatality of North America for the years 1893-1902 inclusive. A fairer comparison would be with the Northwestern states and mines of the border country. Any such comparison would be greatly in favor of Montana. To take Washington, an adjoining state, our fatality rate is 3.10 per thousand employed, as compared with their average for ten years of 7.43. Our average for the past two years is below the general average, and the Inspector is confident that should the second suggestion made by him to your excellency under the head of "Needed Legislation," be favorably recommended and the amendment adopted by the legislature, that the fatalities will be very greatly reduced in the state,which would decrease our fatality rate far below the general average and put our state among the very lowest of all.

SUGGESTIONS ON NEEDED LEGISLATION.

The present Coal Mining Laws were framed placing the inspection of the coal mines in the state under the supervision of the State Mine Inspector. The Eighth Legislative Assembly of the State of Montana passed a bill creating the Office of State Coal Mine Inspector, but nothing was done in the way of re-

adjustment of the mining laws. As suggested in former reports, it appears that a readjustment of these combined laws is necessary.

A second suggestion would be that an amendment be made to the existing laws with an idea of lessening the number of accidents from "falls." During the past four years, as stated in another part of this report, there have been a total of 33 fatal accidents in the coal mines of the state. These accidents have been classified as follows: Twenty-six from falls of rock or coal, four killed by trips and three miscellaneous. It is of the first subdivision that especial attention is brought to. It is seen that this number is 79 per cent of the total. Fourteen of these fatalities occurred at Red Lodge, five at Stockett, three at Belt and one each at Aldridge, Rock Springs Coal Company (Sand Coulee), Bridger and the mines of the Nelson Coal Company at Sand Coulee. It is the opinion of the Inspector that at least one-half of the accidents from this cause could have been avoided had the miners exercised proper care in looking after their own safety. Under the existing laws, the mining companies are forced to furnish the miners sufficient and proper timbers for their working places, but no provision is made that the mining companies are compelled to see that the miners do not neglect to look after their own safety. The Inspector suggests that the following amendment should be adopted:

"In all coal mines of the state the mine foreman or his assistants shall make a careful examination each day of all the working places and traveling roads, to see that the roof and sides are properly supported by timber, and to see that the rules in regard to systematic propping are faithfully carried out. Any miner or other workman found violating these rules, or neglecting to comply with their provisions, shall be suspended. Reports of all examinations shall be recorded in a book, which shall be kept in an office at the mine for that purpose and shall be signed forthwith by the person making the examination."

I see no reason why the coal companies should make any opposition to this amendment and surely the miners themselves should agree that it is more merciful to suspend a man for a violation of these rules than to allow him to lose his life through neglecting to comply with a law which has been enacted with a view of reducing the present fatalities from falls of rock and

coal, which are certainly at this time excessive.

A third suggestion is that a general law should be passed by the state requiring all employers employing more than a certain number of persons, say twenty-five, to pay certain sums during idleness caused by accidents received while at work, and for death, caused by accidents while at work. Too much cannot be said about the great good that could be accomplished by such a law whereby the injured, and the widows and orphans of those killed, and other persons dependant upon the unfortunate miners, could be cared for. Such a system has been notably adopted by the Lehigh Coal and Navigation Company of Pennsylvania. This company contributes one cent per ton of all coal sent to market and all employes inside and outside of the mines one per cent per month of their earnings. It would be difficult to secure complete co-operation between all of the employers and employes unless the law was made mandatory. By making this law applicable to all employers in the same degree, the cost of operating could be computed with this additional cost considered legitimate expense. Such a law would also tend to reduce accidents to a minimum and would also compel the general public (which would include the employers themselves) to be responsible for the poor unfortunates who are injured while doing public service. There should be no reason why such a law should not be adopted whereby the companies shall contribute one cent per ton and the employes one per cent of all their earnings, to be paid monthly to some person designated as treasurer, and upon the information obtained from this department, the fund could be paid to the proper person or persons. In the interest of humanity I would therefore suggest that such a law be passed in Montana.

ANALYSIS OF COALS FROM THE ROCKY MOUNTAIN FIELDS.

Montana.

FIELD	Character of Coal	Water	Volatile Combustable Matter	Fixed Carbon	Ash	Fuel Ratio
CLARK'S FORK—						
(Upper Measure)	Lignitic	6.53	38.22	48.33	6.92	1.26
(Upper Measure)	Lignitic	6.86	37.54	47.07	8.53	1.25
(Upper Measure)	Lignitic	6.02	37.30	46.28	10.40	1.24
CLARK'S FORK—						
(Lower Measure)	Lignitic	4.42	32.36	44.19	19.03	1.37
(Lower Measure)	Lignitic	5.47	34.20	43.95	16.33	1.29
Yellowstone	Coking	1.02	38.01	48.20	11.87	1.27
Yellowstone	Semi-coking	2.14	37.01	55.54	5.31	1.50
Horr	Coking	.67	30.90	57.56	10.87	1.86
Horr	Semi-anthra	1.02	18.77	75.87	4.34	4.04
Trail Creek	Lignitic	10.51	31.87	49.22	8.57	1.54
Trail Creek	Lignitic	7.70	37.11	45.00	10.19	1.21
Belt Mountain	Semi-coking	3.68	25.43	58.05	11.71	2.28
Bull Mountain	Dry Lignitic	7.84	42.71	42.65	6.80	9.91
Bull Mountain	Dry Lignitic	6.42	38.54	49.94	5.10	1.30
Eastern	Lignitic	21.11	28.55	44.98	5.01	1.58

COAL TESTS.

The following is a summary of a series of detailed tests conducted by the Northern Pacific Railway Company for the purpose of determining the relative values of the various coals that are at present used or that may be required.

Each test was made on from 30 to 40 tons of coal, all being conducted under exactly similar conditions. The tests were complete, including the determination of the theoretical efficiency of the coals from an ultimate analysis, a stationery boiler test, and tests on both mogul and consolidation engines hauling a given tonnage and operated both ways over a division that included the maximum as well as the minimum grades.

The results include the calculated percentage values of the various fuels referred to the standard. One of the coals from the Youghiogheny district of Pennsylvania is taken as the standard.

The summary is of special interest, as it shows the relative values of the coals of the eastern portion of the United States as compared with those of the Rocky Mountain regions.

In the preparation of the table, the name of the mine has not been given, it being deemed sufficient to give the district from which the coal was obtained.

Practical Tests of Rocky Mountain Coals.

DISTRICT	Character of Coal	THEORETICAL			STATIONERY BOILER TESTS		
		Calorific Power (B. T. U.) Per Pound.....	Evaporation from and at 212 deg.—Lbs	Relative efficiency—Per Ct...	Actual Evaporation at Working Temperature and Pressure—Lbs...	Evaporation from and at 212 deg.—Lbs.....	Relative Efficiency—Per Ct...
Youghiogheny, Pa.	Bituminous	13,860	14,351	100	6.83	8.17	100
Youghiogheny, Pa.	Bituminous	14,053	14,551	101	6.99	8.37	102
West Virginia	Bituminous	14,054	14,552	101.4	6.57	7.90	104.3
Moon Ridge	Bituminous	13,888	14,380	99.9	6.83	8.21	108.6
Arnold Ridge	Coking	13,766	14,253	98.9	6.85	8.20	108.7
Shenango, Pa.	Bituminous	13,284	13,754	96.4	5.87	7.07	93.5
Hocking Valley	Bituminous	11,829	12,248	89.7	5.73	6.87	92.1
Horr, Mont.	Coking	12,984	13,443	93	6.18	7.40	100.7
Bozeman, Mont.	Bituminous	12,113	12,542	88.4	5.30	6.34	84.6
Rocky Fork (Rock Creek District)	Semi-bituminous	10,553	10,926	80	5.82	6.97	94.6
Rocky Fork (Rock Creek District)	Semi-bituminous	10,793	11,175	81.2	5.79	6.93	93.4
Rocky Fork (Bear Creek District)	Semi-bituminous	10,434	10,802	8.11	5.30	6.36	86.1
Trail Creek	Semi-bituminous	.....	.....	.....	5.79	6.88	93.1
Clark's Fork, Mont.	Lignitic	10,545	10,918	79.7	4.82	5.79	78.3
Miles City, Mont.	Lignitic of Plains	7,721	7,994	.....	3.60	4.32	60.5
Rock Springs, Wyo.	Semi-bituminous	11,861	12,281	89.7	5.90	7.11	95.6
Carbon	Semi-bituminous	11,750	12,166	85.6	5.23	6.27	84.2
Roslyn, Wash.	Semi-bituminous	12,382	12,821	90	5.66	6.77	90.5
Wilkinson, Wash.	Coking	12,706	13,156	91.1	5.76	6.91	92.6

Practical Tests of Rocky Mountain Coals.

DISTRICT	Character of Coal	MOGUL LOCOMOTIVE TEST			CONSOLIDATION LOCOMOTIVE TEST		
		Actual Evaporation at Working Temperature and Pressure—Lbs..	Evaporation from and at 212 deg.—Lbs.....	Relative Efficiency—Per Ct..	Actual Evaporation at Working Temperature and Pressure—Lbs...	Evaporation from and at 212 deg.—Lbs	Relative Efficiency—Per Ct...
Youghiogheny, Pa.	Bituminous	6.90	8.35	100	6.94	8.42	100
Youghiogheny, Pa.	Bituminous	7.42	8.98	107.5	7.63	9.27	110.1
West Virginia	Bituminous	5.96	7.30	94	8	9.71	106.6
Moon Ridge	Bituminous	5.77	7.08	91.2	7.47	9.07	99.5
Arnold Ridge	Coking	6.62	8.06	103.8	7.59	9.19	100.8
Shenango, Pa.	Bituminous	5.56	6.81	87.7	7.74	8.21	90.1
Hocking Valley	Bituminous	5.08	6.21	80	5.96	7.21	79.1
Horr, Mont.	Coking	.....	.....	.....	5.67	6.81	74.7
Bozeman, Mont.	Bituminous	5.15	6.27	80.8	5.86	7.14	78.3
Rocky Fork (Rock Creek District)	Semi-bituminous	4.97	6.06	78	5.52	6.74	74
Rocky Fork (Rock Creek District)	Semi-bituminous	5.30	6.47	83.2	5.57	6.80	74.5
Rocky Fork (Bear Creek District)	Semi-bituminous	4.57	5.55	71.5	5.65	6.83	75.5
Trail Creek	Semi-bituminous	5.14	6.25	80.5	5.02	6.16	67.6
Clark's Fork, Mont.	Lignitic	4.70	5.73	73.8	5.37	6.54	71.8
Miles City, Mont.	Lignitic of Plains	.....	.....	.....	.....	.....	.....
Rock Springs, Wyo.	Semi-bituminous	5.29	6.46	83.5	5.96	7.24	79.5
Carbon	Semi-bituminous	3.62	4.43	57	6.03	7.35	80.5
Roslyn, Wash.	Semi-bituminous	4.99	6.08	78.3	6.02	7.33	80.4
Wilkinson, Wash.	Coking	4.62	5.62	72.4	6.47	7.88	86.5

MONTANA.

The coal bearing formations of this State have a greater range in the geological scale than elsewhere in the Rocky Mountain region. This range is from the Jurrassic to the Tertiary, though most of the coal is of the Cretaceous age. There is a small area of Jurassic rocks which contain one seam of coal. This is not, however, of workable thickness, and the occurrence is of interest only as indicating the beginning of conditions favorable to the formation of coal during that period. The formations containing valuable coal deposits occupy the entire range of the Cretaceous, coal being found in the Cascade formation at a lower horizon than in any of the fields south of Montana.

As in Wyoming, the plains region to the east of the Rocky Mountains, extending into the Dakotas, is underlain by beds of lignitic coal of carying quality. Westward from the plains the coal gradually changes in character. The beds adjacent to the outlying spurs contain a higher grade of lignitic coal, while in those along the base of the main range are bituminous and coking coals.

The coal fields of Montana form a nearly continuous belt extending in a northwest-southeast direction entirely across the State. Very little detailed investigation has been made in most of these fields, however, and hence only a general idea can be given of their value. Only in a few of the fields are data as to the number of coal beds obtainable. Generally the coal beds are extremely variable, the gradation from coal to bone or shale being very abrupt, while the coal is sometimes entirely cut out by a bed of sand-stone.

BULL MOUNTAIN FIELD.

The productive measures of this field, which are probably Fort Union, lie above the formations of the surrounding plains. The underlying Laramie also contains several beds of workable thickness, though the coal is not equal in quality to that found in the higher formation. The field lies about 45 miles northeast of the town of Billings and an equal distance from the Northern Pacific Railway.

The outcrop of the only workable bed outlines an elliptical area of 55 square miles, all of which contains workable coal. Extensive prospecting along the outcrop around the entire field has demonstrated the evenness of the strata, their inclination at no

point being greater than 6 deg. The center of the basin is located a little west of the center of the field.

On the east-west axis through the center of the field the bed acquires its greatest thickness of 16 feet of clean coal, thinning down to 10 feet at the extreme western end. In the eastern portion of the field there is about the same thickness of coal, but a band of sandstone, only a few inches in thickness through the greater part of the field, separates the seam into two benches, the sandstone acquiring a maximum thickness of 50 feet.

This coal is lignitic in character, but, as shown by the accompanying analysis, is of a much higher grade than that in the underlying formations. Only a small quantity of coal is now mined in this field, as the country is almost entirely a cattle and sheep range.

CLARK'S FORK FIELD.

The Bighorn Mountain uplift has brought the Laramie to the surface along its western side, forming the Clark's Fork Field. It crosses the Yellowstone River 22 miles west of Billings and extends thence north to the Musselshell River. The northward extension of this field is not known to contain coal beds of value. At a point about 8 miles south of the Yellowstone River the beds acquire a workable thickness, which is maintained southward to the Bighorn Basin Field of Wyoming.

The coal occupies the bottom of the Laramie formation, the "basal sandstone" being exposed but 10 feet below the lowest bed while the bed now worked is 50 feet above. The inclination of the bed averages about 5 deg. toward the west.

The bed which is mined varies in thickness from 5 feet at the northern end of the workable area, to three feet about six miles north of this point, and again increases to nearly 5 feet within the next 15 miles.

There are two other beds at this point, one immediately above the bottom of the Laramie, the other about 500 feet higher. Neither of these beds has developed a workable thickness at any of the points where they have been opened.

The coal is lignitic, but has a peculiar structure. Bands of bright coal alternate with bands having a dead appearance and closely resembling bony coal. The proportion of the latter gradually increases toward the north, where they become shale lenses so that the product is of little value. Toward the south the coal is very bright and quite pure.

The field is reached by a branch of the Northern Pacific Railroad, the principal market for the product being the mines and smelters of Butte and vicinity.

ROCKY FORK FIELD.

This field is situated only about three miles west of the Clark's Fork Field. The coal bearing rocks are immediately above the Laramie strata and probably beling to the Fort Union. The field lies at the base of the Beartooth Mountains, around which the carboniferous limestones are almost vertical. The coal bearing strata dip west at an angle of about four degrees. The strata at the northern border of the field are much more steeply inclined, the dip being 21 deg. to the south. The slope of the only producing mine in this field is driven south from this northern border and the strata flatten rapidly in this direction, soon assuming the normal westerly dip. The field is about six miles in length north and south and extends eastward 5 miles from the limiting limestones of the western border.

There are five beds of workable thickness throughout the field. The following is an average section:

Section of Coal Beds in Rocky Fork Field.

	Ft.	In.
Bed No. 1	5	3
Intervening shales, clays and soft sandstones	71	0
Bed No. 2	4	11
Intervening strata	58	0
Bed No. 3	7	9
Intervening strata	40	0
Bed No. 4	4	0
Intervening strata	70	0
Bed No. 5	5	0

The coal is very similar in character to that of the Canyon City coal field of Colorado; it is of a transitional type between bituminous coal and lignite, making an excellent steam and domestic coal. The only mine operated in this field is that at Red Lodge, owned by the Northern Pacific Railroad Company, a large part of their supplies for their locomotives being taken from this mine. The output will soon be increased by the enlargement of the plant and the addition of a washer to handle the fine sizes that have hitherto been thrown away on account of the large amount of impurities contained.

It is probable that a connecting field will be discovered in the

rough country at the base of the mountains between this field and the one located 60 miles toward the northwest, on the Boulder River.

YELLOWSTONE RIVER.

The outcrop of the coal bearing formations can be followed 150 miles from the extreme eastern end on the Boulder River through the Boulder, Livingston-Bozeman, and Sixteenmile, and Shields River basins, thence circling around the northern and eastern end of the Crazy Mountains and connecting with the western end of the plains field.

The Boulder district comprises the area of Laramie along the drainage of the West Boulder, extending thence west as far as the Yelowstone River at Livingston. The aea covered by the coal measures is 30 miles in length east and west, and from 5 to 18 miles in breadth. This northern border of the field is formed by the edge of the overlying Livingston formation. The strata dip north, away from the Boulder Mountains, from 12 deg. to 45 deg.

Only one coal bed has as yet been discovered in this field. This has a maximum thickness of 4 feet at the eastern end, on the West Boulder River.

The coal cokes, and although it has never been tested on a large scale, laboratory tests indicate that it is a high grade fuel.

The Livingston-Bozeman district consists of the continuation of the Boulder district from the Yellowstone River westward.

The coal bearing formations outcrop along the northern base of the mountains westward to the Gallatin Range, and their outcrops swing northward along the eastern base of the Gallatin and Bridger Ranges. This district contains the maximum thickness of coal in the entire field, and is the only portion in which actual mining is now going on.

The strike of the bed follows very closely parallel to the neighboring mountains, the dip being everywhere away from them. Numerous minor fault planes occur where the strike of the beds make an abrupt change in direction, and the dislocation of the strata has been further increased by the subsequent intrusion of igneous rock.

Four coal beds have been discovered in this field, one of which never attains workable thickness. As a rule, only one bed is productive at any one point, the others having been pinched

down below the limit of profitable mining. The beds are composed of alternating bands of coal, bony coal, bone and shale, in varying proportions, and the gradation from one to the other is very abrupt. In several instances which have come under the observation of the writer a band of coal containing but 5 per cent of ash has changed in a distance of but 50 feet along the strike, to material containing as high as 40 per cent of ash. The beds vary from 4 to 16 feet in width, where mined, the dip varying from 25 deg. to 90 deg. The only practicable method of mining consists of taking out the entire bed and passing it through a washer, the result product being a high grade of steam and coking coal.

There are at present two operating mines in this district, one of which has just been opened.

A large proportion of the output is consumed for locomtive fuel on the Northern Pacific Railway, the main line of which crosses the western end of this district.

The Sixteenmile and Shields River districts extend northward 40 miles from the line of the Northern Pacific Railway to the northern end of the Crazy Mountains. From this point they extend westward 45 miles, around the northern end of the Bridger Range. Along the many miles of Laramie outcrop thus exposed the coal has ben prospected by a series of open cuts, which have failed to show any thickening sufficient to warrant the opening of mines and the extension of the railroad. The Cascade formation is at present over a small portion of the western part of this area, and one coal bed has been found a short distance above the measures, but not of workable thickness.

This great area of coal bearing rocks offer a promising field for detailed prospecting, and coal, if found in workable thickness, will be especially valuable by reason of its proximity to the large mines and smelters of Butte and Helena.

TRAIL CREEK FIELD.

This area consists of a small synclinal basin of the Laramie, situated 9 miles south of the Northern Pacific main line at Mountain Side, and separated by only half a mile from the Yellowstone field. At the eastern edge of the field the strata are overturned along the base of a high ridge of carboniferous rocks, from which it extends westward 4 miles, to the base of a ridge formed by an eruptive overflow from the Gallatin range. It ex-

tends north and south along the valley of Trail Creek about nine miles.

There are three coal beds of workable thickness throughout the northern end of the field, where there are two operating mines, in which the coal has a thickness of 4 to 12 feet.

The coal is entirely different in character from that of the Yellowstone field. It yields a large proportion of lump coal and is semi-bituminous, being chiefly valuable for domestic use, while fine coal chiefly is produced at Chestnut and Mountain Side.

The production in 1900 was small, the mines having been connected with the railroad during that year.

CINNABAR FIELD.

This field extends northward from the northern border of the Yellowstone National Park, on either side of the Yellowstone River. The portion of the field on the eastern side of the river probably contains no workable coal.

The main portion of this field occupies the high land extending north from Electric Peak, and is 1,500 feet above the valley of the river. The coal is conveyed to the coke ovens in this valley by a long flume.

That portion of the field in which mining is now being carried on consists of a series of faulted blocks, in which the beds through the southern end of the field are nearly horizontal. The field extends from the high bluffs overlooking the Yellowstone westward three miles to the deeply eroded valley of Cinnibar Creek. Along the northern border the strata are steeply upturned against the base of the Cinnabar Mountains.

There are four coal beds in the main portion of this field, all of which are of workable thickness, the thickest being 5½ feet. The coal has all been highly altered by the eruptive rocks of Electric Peak, several intrusive sheets from which have invaded the coal bearing rocks. The coal from three of the beds make a good grade of coke, that of the other being semianthracite, very hard, and having the characteristic luster and cleavage of anthracite.

There is but one mine operated in this field, a part of its product being converted into coke. The plant has been considerably enlarged since last year, and its capacity is at present much larger than it was in 1900. The field is reached by the Park Branch of the Northern Pacific Railway.

WEST GALLATIN FIELD.

Along the headwaters of the West Gallatin River and between the Gallatin and Madison Ranges there are several isolated areas of the Laramie formation. Their location, however, is so remote that little attention has hitherto been given to the coal.

The only one of the several areas in which coal of value has been found is on Taylor's Fork of the West Gallatin, 75 miles from the Northern Pacific at Bozeman. This area occupies the high divide between the West Gallatin and Madison Rivers. It forms a synclinal area 6 miles across, with dips on the northern margin of 20 deg. and on the southern margin of 6 deg.

There are three coal beds in this field ranging from 4 to 6 feet in thickness. The character of the coal is still in doubt, as none of the development work has exposed any of the beds to a sufficient depth to get beyond the effect of weathering. At some points one of the beds shows a pronounced coking quality, which is probably the character of the coal throughout the area. The other areas in this field offer promising fields for detailed prospecting. Owing to the proximity of large bodies of eruptive rocks, the coal will doubtless be found highly altered. These areas are located on the west fork of the West Gallatin and immediately north of the Sphinx Mountain.

RUBY VALLEY FIELD.

This field is located 30 miles west of the Gallatin field, and has received even less attention than the latter. The rocks are of Laramie age and do not present any indications of serious disturbance. The only prospecting done in this field consists of a series of open cuts along the outcrop. These have as yet failed to develop beds of workable thickness.

TOSTON AREA.

There is an isolated area containing 6 square miles of the Cascade formation, three miles south of the town of Toston, and crossed by the main line of the Northern Pacific Railroad. The strata are badly broken and the field is so small that the erection of a large mining plant would not be warranted. The field could doubtless be operated with profit on a small scale, especially as the coal is coking. There are portions of the bed in which the coal has been altered beyond the coking stage and is essentially graphite.

SMITH RIVER AREA.

This area lies along the high divide east of the Smith River. It is so remote from transportation that no attention has been given to its development, and there is no information obtainable regarding the coal which it may contain.

BELT FIELD.

This field lies along the northern base of the Little Belt Mountains, and their western extension on the west side of the Missouri River, extending westward 125 miles from the Judith River. The country underlain by the coal is so deeply covered by the glacial drift that the strata are exposed only along the canyon walls. The field is a narrow belt extending along the base of the mountains, its strata having a slight dip toward the north, away from the range. This is the only considerable occurrence in the United States of the Kootenai formation of the Canadian coal fields. This formation has been named the Cascade by Mr. Weed. The only coal bed of workable thickness is near the center of the field. The thickest point seems to be in the vicinity of the mines at Sand Coulee. Northward from this point the bed thins out, while toward the west it splits into two benches separated by a bed of shale reaching a thickness of 25 feet. At Sand Coulee the coal is seven and one-half feet in thickness, with three small shale partings. One coal from the various bands is quite different in character, that from the bottom being coking and containing the smallest amount of ash, while that from the other two benches does not exhibit any tendency to coke, but makes an excellent steam fuel. The only objectionable feature is the excessive amount of ash found in the middle bench. Near the mouth of Smith River and on Hound Creek the bed is between 5 and 6 feet in thickness.

The extension of the field west of the Missouri River has never been thoroughly prospected. At some points the coal shows a workable thickness along the outcrop, and future prospecting will doubtless develop a valuable productive area. The coal has been opened at a number of places in the eastward extension of the field through the Judith Basin. The fuel for the town of Lewistown is obtained from the mines at the base of the Judith Mountains.

SWEETGRASS HILLS FIELD.

This field is located on the eastern slope of the foothills of the Rocky Mountains, in the extreme northern portion of Montana. The coal occurs in the Belly River formation, which extends south from Canada. But little development has been done in this field and there are no producing mines. There are three coal beds exposed to workable thickness which are capable of yielding a fair grade of semi-bituminous coal.

AREAS OF THE LAKE BEDS.

Along the summit of the main Rocky Mountain Range and westward there are numerous areas of Neocene lake beds which contain some lignitic coal. None of these areas have as yet developed any coal of value.

The rocks of some of these areas were deposited in the basins of the granite, and others upon more recent beds. They form a series of isolated basins distributed over a region which extends westward 90 miles from the Continental divide and southward into Idaho. They are probably to be correlated with the areas at the base of the Boise Mountains. There are several points at which these lake beds have been subjected to the influence of the later eruptions, and further prospecting may develop coal of a higher grade than that thus far discovered.

Relation of Production to Capacity of Mines for the Rocky Mountain Coal Fields in 1900.

STATE	Number of counties producing coal.....	Number of commercial mines	Production 1900-Short tons	Estimated Capacity of mines 1900 — Short tons.....	Ratio of production to capacity — Per Cent..	Mines reported prospective increase of capacity—Per Cent..
North Dakota	3	36	129,883	172,408	75.3	2
Montana	.....	.....	.....	.....	.....	.....
Idaho	10	29	1,661,780	2,602,068	63.8	15
Wyoming	10	30	4,014,602	7,082,513	56.6	10
Utah	6	35	1,147,027	2,005,963	57.1	4
Colorado	19	116	5,244,364	7,162,092	73.2	8
New Mexico	7	31	1,299,299	2,050,646	63.3	6

Production and Distribution of Product of the Rocky Mountain Coal Fields for 1900.

SUBDIVISION OF FIELDS	Production—Short Tons	Value of Mines	Average Value per ton	Railroad Fuel		Steamboat Fuel	
				Quantity—Short Tons	Per Cent.	Quantity—Short Tons	Per Cent.
North Dakota	129,883	$158,348	$1.22	6,240	4.8	.....	.....
Montana	1,661,780	2,713,757	1.63	522,291	31.4	.....	.....
Idaho	.....	.....	.....	.....	.....	.....	.....
Wyoming	4,014,602	5,457,953	1.36	1,996,440	49.7	7500	.2
Utah	1,147,027	1,447,750	1.26	417,500	36	.....	.....
Colorado	5,244,364	5,858,036	1.12	1,348,140	25.7	.....	.....
New Mexico	1,299,299	1,776,170	1.37	589,806	45.4	.....	.....
Total	13.496,955	17,412,014	$1.29	4,880,417	35.1	7500	.03

SUBDIVISION OF FIELDS	Manufacturing Fuel		Domestic Fuel		Made Into Coke	
	Short Tons	Per Cent.	Quantity—Short Tons	Per Cent.	Quantity—Short Tons	Per Cent.
North Dakota	25,241	19.4	98,402	76.8	.....	.....
Montana	590,696	35.6	415,138	25	133,655	8
Idaho	.....	.....	.....	.....	.....	.....
Wyoming	1,184,620	29.5	793,532	19.9	32,460	7
Utah	395,798	34.9	305,430	27.1	28,299	2
Colorado	1,374,975	26.3	1,550,759	30	970,490	18
New Mexico	121,080	9.4	561,080	43.2	27,333	2
Total	3,692,410	28.5	3,724,391	27.34	1,192,237	9

Development of the Rocky Mountain Coal Fields, by Decennial Periods.

STATE	1880			1900		
	Production—Short Tons	Value	Average Price Per Ton	Production—Short Tons	Value	Average Price Per Ton
North Dakota	.....	.....	.....	30,000	$42,000	$1.40
Montana	224	$800	$3.57	517,477	1,252,492	2.42
Idaho	.....	.....	.....	.....	.....	.....
Wyoming	589,595	1,080,451	1.83	1,870,366	3,193,669	1.70
Utah	14,748	33,645	2.27	318,159	552,390	1.74
Colorado	462,747	1,041,350	2.25	3,094,003	4,344,196	1.40
New Mexico	.....	.....	.....	375,777	504,390	1.34

Development of the Rocky Mountain Coal Fields, by Decennial Periods.

STATE	INCREASE OF 1890 OVER 1880			
	Product Short Tons	Per Cent	Value	Per Cent
North Dakota	30,000	.....	$42,000	.....
Montana	517,253	230,916	1,251,692	156,462
Idaho	.....	.....	.....	.....
Wyoming	1,280,771	217	2,103,218	194
Utah	303,411	2,057	518,745	1,542
Colorado	2,631,256	569	3,302,846	317
New Mexico	375,777	.....	504,390	.....

STATE	1900		INCREASE OF 1900 OVER 1890				
	Production—Short Tons	Value	Average Price Per Ton	Product—Short Tons	Per Cent	Value	Per Cent
North Dakota	129,883	$158,348	$1.22	99,883	333	$16,348	277
Montana	1,661,775	2,713,707	1.63	1,144,298	221	1,461,215	116
Idaho	.....	.....	.....	.....	.....	.....	.....
Wyoming	4,014,602	5,457,953	1.36	2,144,236	115	2,274,285	71
Utah	1,147,027	1,447,750	1.26	828,868	261	895,360	162
Colorado	5,244,364	5,858,036	1.12	2,150,361	70	1,513,840	35
New Mexico	1,299,299	1,776,170	1.37	923,522	241	1,271,780	252

PRODUCTION OF COAL AND COKE.

Production of Coal and Coke for the Year 1898 by Counties.

COUNTY	Coal Produced	Total Value.....	Tons of Coal Used in Making Coke..	Tons of Coke Produced	Total Value.....	No. of Ovens .....
Carbon	271,516	$392,084.20	.....	.....	.....	.....
Cascade	**993,161	* 658,195.15	20,552	9,209	$45,399.69	100.00
Chouteau	1,130	2,260.00	.....	.....	.....	.....
Gallatin	62,969	101,550.40	.....	.....	.....	.....
Meagher ..	50	125.00	.....	.....	.....	.....
Park	121,565	c 231,814.00	102,860	61,026	484,425.00	118.00
Totals	1,450,421	$1,386,028.75	123,412	70,235	$529,825.69	218.00

*Does not include the value of 384,930 tons.
** Does not include the 20,552 tons made into coke.
c Does not include the value of 13,107 tons.

Production of Coal and Coke for the Year 1899 by Counties.

COUNTY	Coal Produced.....	Total Value.....	Tons of Coal Used in Making Coke..	Tons of Coke Produced	Total Value.....	No. of Ovens.....
Carbon	325,774	$440,932.00	.....	.....	.....	.....
Cascade	* 893,605	1,346,526.25	22,688	10,546	$62,096.74	100.00
Chouteau	1,370	2,740.00	.....	.....	.....	.....
Custer	1,042	1,634.00	.....	.....	.....	.....
Fergus	2,787	5,789.00	.....	.....	.....	.....
Gallatin ..	56,271	94,074.45	.....	.....	.....	.....
Granite	47	141.00	.....	.....	.....	.....
Lewis and Clare	50	212.50	.....	.....	.....	.....
Meagher	50	120.50	.....	.....	.....	.....
Park ..	** 127,775	334,702.00	117,897	48,526	339,682.00	118.00
Totals	1,408,771	$2,226,885.20	140.585	59,072	$401,778.74	218.00

* Does not include 22,688 tons made into coke.
** Does not include 117,897 tons made into coke.

Production of Coal and Coke, Year Ending Dec. 31, 1901.

COUNTIES	Capital Invested	Amount Paid for Labor	Tons of Coal Sold (including to Employes)	Tons of Coal Used for Coke	Tons of Coal Used at Mine	Total Production	Total Value at Mine of all Coal Produced	Tons of Coke Produced	Value of Same at Ovens	No. of Ovens in Operation	No. of Days Ovens Were Operated During the Year
Carbon	$2,900,500	$553,954	479,291	.....	12,805	492,096	$616,410	.....	.....	.....	.....
Cascade	963,000	758,443	726,205	37,813	27,565	791.764	1,148,266	18,488	$105,919	100	257
Chouteau	9,100	8,120	3,685	.....	26	3,711	8,550	.....	.....	.....	.....
Fergus	27,600	14,840	7,435	.....	.....	7,435	21,255	.....	.....	.....	.....
Gallatin	110,000	60,241	32,153	.....	1,070	23,223	56,968	.....	.....	.....	.....
Park	950,000	208,583	3,344	65,137	48,946	117,427	352,281	38,516	250,354	128	330
Custer, Dawson, Granite, Lewis and Clarke and Meagher	9,600	6,085	6,913	.....	.....	6,913	13,564	.....	.....	.....	.....
Total	$4,969,800	$1,610,266	1,259,026	$102,950	$90,412	1,442,569	$2,217,294	57,004	$356,273	228	

Production of Coal and Coke, Year Ending Dec. 31, 1900

COUNTIES	Capital Invested	Amount Paid for Labor	Tons of Coal Sold (Including to Employes)	Tons of Coal Used for Coke	Tons of Coal used at Mine	Total Production	Total Value at Mine of all Coal Produced	Tons of Coke Produced	Value of Coke at Ovens	No. of Ovens in Operation	No. of Days Ovens Were Operated During the Year
Carbon	$2,400,000	$479,851 09	393,983	.....	5,935	399,918	$511,610	.....	.....	.....	.....
Cascade	1,468,500	955,954 25	1,044,135	59,176	43,233	1,146,534	1,541,263	17,517	$82,694 07	100	269
Chouteau	7,500	5,800 00	5,137	.....	620	5,757	14,507	.....	.....	.....	.....
Custer	2,500	2,100 00	2,900	.....	100	3,000	4,500	.....	.....	.....	.....
Fergus	12,000	10,910 00	8,700	.....	1,290	9,990	23,507	.....	.....	.....	.....
Gallatin	350,000	58,895 60	26,480	.....	895	27,375	46,537	.....	.....	.....	.....
Park	1,650,000	234,639 58	4,700	74,475	25,600	104,775	235,745	37,175	236,177 00	128	240
Total	$5,890,500	1,748,150 52	1,486,035	133,651	77,663	1,697,349	$2,377,669	54,692	$318,871 07	228	

1903

COUNTIES	Estimated Capital Invested	Total Amount Paid for Labor	Tons of Coal Sold (Including to Employees	Tons of Coal Used for Coke	Tons of Coal Used at Mine	Total Productions	Total Value at Mine of all Coal Produced	Tons of Coke Produced	Value of Coke at Ovens	Number of Ovens in Operation
Carbon	$2,525,000	$566,156	572,236	.....	20,261	592,497	$802,525	.....	.....	.....
Cascade	1,119,000	826,757	730,660	17,802	27,772	776,234	1,243,717	6,982	$45,005	60
Chouteau	54,000	49,237	29,025	.....	.....	29,025	82,812	.....	.....	.....
Custer	8,000	4,346	4,780	.....	.....	4,780	9,560	.....	.....	.....
Dawson	4,000	4,450	3,100	.....	.....	3,100	5,400	.....	.....	.....
Fergus	52,500	53,976	32,261	.....	.....	32,261	98,425	.....	.....	.....
Gallatin	1,250,000	108,442	41,426	.....	4,000	45,426	74,953	.....	.....	.....
Meagher	1,500	325	50	.....	.....	50	400	.....	.....	.....
Park	550,000	97,490	5,112	62,134	2,050	69,296	204,325	37,125	259,875	140
Rosebud	1,200	420	220	.....	10	230	794	.....	.....	.....
Valley	2,000	487	386	.....	.....	386	1,158	.....	.....	.....
Total	$5,567,200	$1,712,256	1,419,256	79,936	54,093	1,553,285	$2,524069	44,107	$304,881	200

1902

COUNTIES	Estimated Capital Invested	Total Amount Paid for Labor	Tons of Coal Sold (Including to Employees	Tons of Coal Used for Coke	Tons of Coal Used at Mine	Total Production	Total Value at Mine of all Coal Produced	Tons of Coke Produced	Value of Coke at Ovens	Number of Ovens in Operation
Carbon	$2,915,500	$506,971	530,758	.....	18,165	548,923	$676,231	.....	.....	.....
Cascade	1,281,800	765,296	727,111	35,240	29,598	791,949	1,072,130	15,588	$95,802	55
Chouteau	17,200	10,525	7,125	.....	65	7,190	17,950	.....	.....	.....
Custer	8,000	7,250	9,950	.....	50	10,000	20,000	.....	.....	.....
Dawson	4,200	300	630	.....	.....	630	1,103	.....	.....	.....
Fergus	61,500	44,900	27,470	.....	65	27,535	67,365	.....	.....	.....
Gallatin	1,250,000	30,207	43,153	.....	3,200	46,353	59,924	.....	.....	.....
Meagher	1,500	200	100	.....	.....	100	250	.....	.....	.....
Park	500,850	73,942	5,595	60,740	3,100	69,435	277,545	35,706	249,942	200
Total	$6,040,550	$1,439,371	1,351,892	95,980	54,243	1,502,115	$2,222,488	51,294	$345,744	255

Summary of Efficiencies.

No.	NAME OF COAL	Price Per Ton	Evaporation From and at 212 deg. F	Cost to Evaporate 1,000 Lbs. of Water	*Relative Value	B. T. U. of Coal	Boiler Efficiency
1	Trail Creek (Mt. House), Nut	$2.85	4.65	$0.306	$2.68	10,141	44.27
2	Trail Creek (Mt. House), Lump	4.15	5.70	.36	3.28	10,863	50.
3	Red Lodge, Lump	4.50	6.50	.345	3.74	10,255	61.
4	Bridger, Lump	4.50	6.10	.371	3.51	10,824	54.3
5	Sheridan, Wyoming, Lump	5.50	5.01	.547	2.88	9,229	52.4
6	Red Lodge, Washed Nut	3.75	5.40	.346	3.11	10,332	50.6
7	Chestnut, Washed Mine Run	3.05	5.30	.288	3.06	11,090	46.5
8	Gebo, Lump	4.00	5.75	.346	3.31	10,215	54.4
9	Bridger, Nut	3.75	4.86	.386	2.80	10,444	44.8
10	Trail Creek, (Kountz's) Lump	4.50	5.44	.413	3.13	9,533	55.
11	Belt, Washed Nut	** 4.50	5.60	.40	3.22	10,406	52.
12	Galt, Canada Lump	** 6.50	6.05	.535	3.49	10,919	53.1
13	Rock Springs, Wyo., Lump	** 6.75	7.55	.448	4.35	12,343	59.
14	Mountainside, Mine Run	3.40	5.78	.294	3.32	10,938	51.

* Compared to Chestnut, Washed, Mine Run.
** Price in Butte.

Summary of Chemical Tests.

No.	NAME OF COAL	Combustible			Moisture	Ash	Heat Units—Calories	Combustable—B. T. U.
		Volatile	Fixed Carbon	Total				
1	Trail Creek (Mt. House), Nut	25.92	48.85	74.77	9.04	16.19	7534	13,562
2	Trail Creek (Mt. House), Lump	25.34	52.62	77.96	8.75	13.29	7734	13,921
3	Red Lodge, Lump	26.24	52.39	78.63	9.23	12.14	7245	13,042
4	Bridger, Lump	26.55	54.	80.55	7.67	11.78	7465	13,438
5	Sheridan, Wyo., Lump	26.78	46.40	73.18	21.2	5.62	7006	12,611
6	Red Lodge, Washed Nut	26.15	53.52	79.67	9.05	11.28	7205	12,970
7	Chestnut, Washed Mine Run	23.10	56.18	73.28	8.64	18.08	8407	15,133
8	Gebo, Lump	21.46	47.40	68.86	6.42	24.72	8241	14,834
9	Bridger, Nut	30.00	50.64	80.64	3.95	15.41	7195	12,952
10	Trail Creek (Kountz's) Lump	26.24	47.65	73.89	12.41	13.70	7167	12,901
11	Belt, Washed Nut	22.65	55.00	77.65	4.23	18.12	7445	13,402
12	Galt, Canada, Lump	24.28	57.45	81.73	8.00	10.27	7421	13,359
13	Rock Springs, Wyo., Lump	27.90	61.31	89.21	5.64	5.15	7686	13,836
14	Mountainside, Mine Run	26.84	49.91	76.75	2.71	20.54	7918	14,252

Agreement United Mine Workers of America with Coal Companies of Montana, Year Commencing Oct. 1, 1903.

Helena, Mont,. Sept. 25, 1903.

It is hereby agreed between the general managers of the coal departments on behalf of their respective companies on the one hand, and the representatives of the United Mine Workers of America and their District No. 22 on behalf of their organization on the other hand, that the following scale of prices and the following rules shall be in effect for one year commencing October 1st, 1903. This agreement applies only to the mines being operated by them in Montana:

GENERAL PROVISIONS.

Hours of Work.

Section 1. All miners and inside mine laborers shall be included in the eight (8) hour law; outside men to remain as at present.

Price of Powder.

Sec. 2. Black powder is to be sold to the miner for $2.50 per keg; giant powder at 20 cents per pound. In case of any advance in the buying price of powder a like advance is to be made in the selling price to the miner.

Pay Day.

Sec. 3. Pay day is to be monthly, as at present.

Doctor.

Sec. 4. Each Local shall have the power to make their doctor and hospital arrangements, and that they may handle all moneys collected for them for that purpose. (This rule does not apply to the coal departments of the Anaconda Copper Mining Co. or Washoe Copper Co.)

Inside Day.

Sec. 5. This scale of prices is based upon an eight-hour work day for all inside men, and it is definitely understood that this shall mean eight hours at the face exclusive of noon time—six days a week or 48 hours in the week, provided the operators desire the mine to work, and no Local ruling shall in any way affect this agreement of impose conditions affecting the same.

Duties of Pit Committee.

Sec. 6. (a) The duties of the pit committee shall be confined to the adjustment of disputes between the pit boss and any mem-

ber of the U. M. A. working in and around the mines arising out of this agreement, the pit boss and said miner or mine laborers having failed to agree.

(b) In case of any local trouble arising in any mine through such failure to agree between the pit boss and any miner or mine laborer, the pit committee and the pit boss are empowered to adjust it, and in the case of their disagreement it shall be referred to the superintendent of the company and the president of the Local Union, or such person as he may designate to represent him; and should they fail to agree it shall be referred to the manager of the company and the district president of the U. M. W. of A. for adjustment; and in all cases the mines, miners, mine laborers and parties involved must continue at work pending an investigation and adjustment, until a final decision is reached in the manner above set forth.

c) If any day men refuse to continue work because of a grievance which has or has not been taken up for adjustment in the manner provided herein, and such action shall seem likely to impede the operation of the mine, the pit committe shall immediately furnish a man or men to take such vacant place or places at the scale rate, in order that the mine may continue at work; and it shall be the duty of any member or members of the United Mine Workers who may be called upon by the pit boss or pit committee to immediately take the place or places assigned to him or them in pursuance hereof.

(d) The pit committee, in the discharge of its duties, shall under no circumstances go around the mine for any cause whatever unless called upon by the pit boss or by a miner or company man who may have a grievance that he has first tried to and cannot settle with the boss. Any pit committeeman who shall attempt to execute any local rule or proceeding in conflict with any provisions of this contract, or any other made in pursuance thereof, shall be forthwith deposed as committeeman. The foregoing shall not be construed to prohibit the pit committee from looking after the matter of membership dues and initiations in any proper manner.

(e) Members of the pit committee employed as day men shall not leave their places of duty during working hours except by permission of the operator, or in cases involving the stoppage of the mine.

(f) The right to hire and discharge, the management of the

mine and the direction of the working force are vested exclusively in the operator, and the U. M. W. of A. shall not abridge this right. It is not the intention of this provision to encourage the discharge of employes or the refusal of employment to applicants because of personal prejudice or activity in matters affecting the U. M. W. of A. If any employe shall be discharged or suspended by the company and it is claimed that an injustice has been done him, the committee, together with the employe in question, shall present the case to the superintendent of the mine within ten days. If satisfactory settlement is not made with the superintendent it shall be taken up by the superintendent and the officers of the Local, and in case they fail to agree it may be taken up with the manager of the company by the officers of the district within fifteen days thereafter. If the complaint is not brought before the superintendent in writing within ten days, as provided above, it shall not be considered at any time thereafter.

Contstruction and Extensive Repairs.

Sec. 7. The erection of head frames, buildings, scales, machinery, railroad switches, etc., necessary for the completion of a plant for loading, all being in the nature of construction work, is to be excluded from the jurisdiction of the U. M. W. of A. Extensive repairs to or rebuilding the same class of work shall also be included in the same exception. The employes thereon to be excluded as above when employe don such work only.

Tool Sharpening.

Sec. 8. Where the company does the sharpening, the price of blacksmithing shall not exceed one and one-third per cent of the gross earnings, the miners' tools to be given preference over all other work done by the blacksmiths, and tools shall be sharpened in a workmanlike manner.

Penalty for Loading Impurities.

Sec. 9. In case rock, slate, bone, clay, sulphur or other impurities are sent up with the coal by miner it shall be the duty of whomsoever the company shall designate as inspector, to report same, with the estimated weight thereof, and the miner so offending shall have such weight deducted from established weight of car. For the third, or for any malicious or aggravated offenses, the miner may be indefinitely suspended or discharged. Said estimated weight to be determined by an inspector designated by the operator, and who shall be a member of the United Mine Workers of America.

Penalty for Stoppage of Work.

Sec. 10. If any employe or employes shall cause a stoppage of work in violation of this agreement he shall be subject to discharge by the company without recourse.

Preference in Employment.

Sec. 11. In case a member is thrown out of employment he shall be given preference in other mines in same camp operated by the same company..

Repairs and Emergency Work.

Sec. 12. It is definitely understood and agreed that an eight-hour day means, eight hours work in the mine at the usual working places ,six days a week when required by the operator, Sundays excepted. But this rule does not apply to those men whose employment requires them to work seven days in the week, nor to the making of necessary repairs. In cases of urgent necessity, where it is necessary to operate the mine on Sunday, this matter can be arranged with the executive committee of the Local Union.

Removal of Water.

Sec. 13. In all places where water accumulates, the same shall be bailed or pumped out by company.

Delivery of Cars.

Sec. 14. Miners or loaders shall not be required to push their cars more than one hundred feet, and in cases where the roadway is so steep that they cannot push cars, they shall be delivered at the face by the driver. This rule does not affect rooms where the cars are operated by McGintys.

Labor Rate in Excess of Agreement.

Sec. 15. All wages paid for labor in or around the mines in excess of this agreement shall remain the same.

No New Conditions.

Sec. 16. No Local shall be allowed to make any new conditions which conflict with the terms of this agreement until after the expiration of the specified life of the agreement.

Prices, Etc., Not Mentioned.

Sec. 17. Prices and conditions not mentioned to remain the same.

Rate for Miners on Other Work.

Sec. 18. A miner taken unwillingly from the face to perform day work shall receive the maximum day wage of the mine. A miner working at the face by the day shall receive the same rate.

Deaths and Funerals.

Sec. 19. In the event of an instantaneous death by accident in the mine, the miners and underground employes of the entry on which accident occurred shall discontinue work for the remainder of that day; but work, at the option of the operator, shall be resumed the day following and continue thereafter. In case the operator elects to operate the mine on the day of the funeral of the deceased, as above, or where death has resulted from an accident in the mine, individual miners and underground employes may, at their option, absent themselves from work for the purpose of attending such funeral, but not otherwise. And whether attending such funeral or not, each member of the U. M. W. of A. employed at the mine at which the deceased member was employed, shall contribute fifty (50) cents and the operator twenty-five (25) dollars for the benefit of the family of the deceased or his legal representatives, to be collected through the office of the company. In the event that the mines are thrown idle on account of the miners or other employes failure to report for work in the time intervening between the time of the accident and the funeral, or on the day of the funeral, then the company shall not be called upon for the payment of the twenty-five (25) dollars above referred to.

Except in cases of fatal accidents, as above, the mine shall in no case be thrown idle because of any death or funeral; but in the case of the death of any employe of the company or member of his family, ony individual member may, at his option, absent himself from work for the purpose of attending such funeral, but not otherwise.

Penalty for Absence From Work.

Sec. 20. When any employe absents himself from his work for a period of two days, unless through sickness, or by first having notified the pit boss and obtained his consent, he may be discharged.

Legal Holidays.

Sec. 21. New Year's Day, Fourth of July, Labor Day, Thanksgiving and Chirstmas, only, shall be observed as holidays, and they shall be considered in the same manner as Sundays in so far that the mine shall be idle on these days unless otherwise mutually agreed with the Local Union.

Scale of Day Wages—Inside.

Miners	$3.60
Timbermen	3.60
Track layers	3.60
Shooters	3.60
Machine runners	3.60
Driller	3.60
Drivers—one or two mules or horses	3.13
Drivers—more than two mules or horses	3.35
Parting men	3.00
Machine helpers	3.00
Drill helpers	3.00
Pump men	3.60
Pipe foremen	3.50
Pipe men	3.13
Ditch men—Present Rate	....
Greasers	1.60
Trappers	1.25
Rope rides—main rope	3.50
Rope riders—other ropes	3.13
Pulley repaireres	3.50
Inside engineers	3.13
Bellers—Present Rate	....
Motor men	3.13
Cagers	3.50
Inside laborers, not otherwise classified	3.00

Scale of Day Wages—Outside.

Engineers—first class license	$ 4.00
Other engineers	3.50
First blacksmiths	4.00
Other blacksmiths	3.50
Blacksmiths helpers	2.50
Head carpenter	4.00
Other carpenters	3.50
Car repairers	3.50
Machinists	3.00
Fireman	3.00
Ash men	2.50
Weighmen	3.50
Assistant weighmen	3.00

First brakemen	3.00
Other brakemen	2.50
Couplers	2.50
Greasers	1.60
Head washermen	3.50
Jig men	3.00
Other washermen	2.50
Breaker boss	3.00
Breaker boys	1.00
Barn men—per month	90.00
Ass't barn men—per month	65.00
Pin knocker	2.75
Tipple laborers	2.50
Oilers	2.75
Wipers	2.75
Drill boys in shops	1.50
Outside laborers, not classified	2.50

MINING RATES.

Belt Mine.

Mining conditions and prices to remain as at present.

Chestnut & Mountain Side.

Conditions and prices to remain as at present until such time as the mine is operating under normal conditions, when a scale will be put in to weigh the coal and a rate established between the management of the mine and the district officers of the United Mine Workers of America.

Red Lodge.

Mining conditions and prices to remain as at present.

Stockett Mine.

Section 1. Machine men, 1¾ cents per square foot; machine helpers, 1½ cents per square foot, for all places over 12 feet wide. Machine men, 3 cents per square foot, and machine helpers, 2 cents per square foot, for all places 12 feet wide and under. In deficient places machine runner to be made up to average of $3.60 per day, and machine helper $3.00 per day. The mine committee and pit boss to decide what is a deficient place.

Sec. 2. Drillers working as partners: Price for coal hole, 12½ cents each; price for rock hole, 20 cents each; price for sump hole, 32½ cents each; price for lifting bottom holes, 20 cents each; drillers who are working with helpers, 15 cents per coal

hole and helpers 10 cents per hole. The same rates and conditions apply to drillers and drill helpers in making up for deficient places.

Sec. 3. Loading coal, 21 cents per ton of 2,000 lbs., run of mine. No loader shall load coal in rooms or entries farther than 10 feet, and pillars no farther than 15 feet, and loaders shall keep all rock 9 feet from the face; where more than the average quantity of rock exists the company shall furnish men to clean such places.

Sand Coulee Mines.

Section 1. Machine men, 1¾ cents per square foot; machine helpers, 1½ cents per square foot, for all places over 12 feet wide. Machine men, 3 cents per square foot, and machine helpers, 2 cents per square foot, for all places 12 feet wide and under. In deficient places machine runners to be made up to average of $3.60 per day, and machine helper $3.00 per day. The mine committee and pit boss to decide what is a deficient place.

Sec. 2. Drillers working as partners: Price for coal hole, 12½ cents each; price for rock hole, 20 cents each; price for sump hole, 32½ cents each; price for lifting bottom holes, 20 cents each; drillers who are working with helpers, 15 cents per coal hole and helpers 10 cents per hole. The same rates and conditions apply to drillers and drill helpers in making up for deficient places.

Sec. 3. Loading coal, 21 cents per ton of 2,000 lbs., run of mine. No loader shall load coal in rooms or entries farther than 10 feet, and pillars no farther than 15 feet, and loaders shall keep all rock 9 feet from the face; where more than the average quantity of rock exists the company shall furnish men to clean such places.

Sec. 4. Pick mining, 70 cents per ton of 2,000 lbs., run of mine; broken coal, 75 cents per ton of 2,000 lbs.; and select lump, 80 cents per ton of 2,000 lbs.

Sec. 5. Yardage in entries, $2.50 per yard; cross cuts in entries, $2.50 per yard; cross cuts between rooms 12 feet wide, $1.25 per yard; opening rooms ,$6.00.

On behalf of the UNITED MINE WORKERS OF AMERICA,

M. F. PURCELL,
President of District No. 22.

THOMAS BURKE,
Member of National Board.

On behalf of the COAL MINE OPERATORS,

H. J. HORN,

General Manager, Coal Department, Northwestern Improvement Company in Montana.

LEWIS STOCKETT,

Manager, Cottonwood Coal Company.

F. W. C. WHYTE,

General Manager, Coal Department, Anaconda Copper Mining Company in Montana.

ED. GERBER,

Manager, Rock Springs Coal Company.

A. O. NELSON,

Manager, Nelson Coal Company.

Agreement United Mine Workers of America with Coal Companies of Montana, Year Commencing Oct. 1, 1904.

Helena, Mont., Sept. 2, 1904.

It is hereby agreed between the general managers of the coal departments on behalf of their respective companies on the one hand, and the representtives of the United Mine Workers of America and their District No. 22 on behalf of their organizations on the other hand, that the following scale of prices and the following rules shall be in effect for one year, commencing Oct. 1, 1904. This agreement applies only to the mines being operated by them in Montana.

GENERAL PROVISIONS.

Hours of Work.

Section 1. All miners and inside mine laborers shall work eight hours a day, outside men to remain as at present. Rope men and others, whose duties are both inside and outside the mine, shall be considered as outside employes, and work ten hours per day.

Price of Powder.

Sec. 2. Black powder to be sold to the miner for $2.50 per keg; giant powder at 20 cents per pound; caps one cent a piece; fuse one cent a foot. In case of any advance in the buying price of the above a like advance is to be made in the selling price to the miner.

Pay Day.

Sec. 3. Pay day is to be monthly, as at present.

Doctor.

Sec. 4. The matter of doctor and hospital arrangements is to be arranged between the employes and the management at each camp, and when so arranged the company agrees to make the collections for that purpose.

Fines, Dues and Assessments.

Sec. 4. No dues, fines or assessments shall in any way be collected by the company.

Inside Day.

Sec. 5. This scale of prices is based upon an eight-hour work day for all inside men, and it is definitely understod that this shall mean eight hours' work at their working place, exclusive of noon time—six days a week or 48 hours in the week, provided the operators desire the mine to work, and no local ruling shall in any way affect this agreement or impose conditions affecting the same.

Adjustment of Disputes.

Sec. 6. (a) The duties of the pit committee shall be confined to the adjustment of disputes between the pit boss and any member of the U. M. W. of A. working in and around the mines, arising out of this agreement, the pit boss and said miner or mine laborers having failed to agree.

(b) In case of any local trouble arising in any mine through such failure to agree between the pit boss and any miner or mine laborer, the pit committee and the pit boss are empowered to adjust it, and in the case of their disagreement it should be referred in writing to the superintendent of the company and the president of the Local Union, or such person as he may designate to represent him; and should they fail to agree it shall be referred to the manager of the company and the district president of the U. M. W. of A. for adjustment; and in all cases the miners, mine laborers and parties involved must continue at work pending an investigation and adjustment, until a final decision is reached in the manner above set forth.

(c) If any day men refuse to continue work because of a grievance which has or has not been taken up for adjustment in the manner provided herein, and such action shall seem likely to impede the operation of the mine, the pit committee shall immediately furnish a man or men to take such vacant place or places at the scale rate, in order that the mine may continue at work:

and it shall be the duty of any member or members of the United Mine Workers, who man be called upon by the pit boss or pit committee, to immediately take the place or places assigned to him or them in pursuance hereof.

(d) The pit committee in the discharge of its duties, shall under no circumstances go around the mine for any cause whatever, unless called upon by the pit boss or by a miner or company man who may have a grievance that he has first tried to and cannot settle with the boss. Any pit committeeman who shall attempt to execute any local rule or proceeding in conflict with any provisions of this contract, or any other made in pursuance thereof, shall be forthwith deposed as committeeman. The foregoing shall not be construed to prohibit the pit committee from looking after the matter of membership dues and initiations ni any proper manner.

(e) Members of the pit committee employed as day men shall not leave their places of duty during working hours, except by permission of the operator, or in cases involving the stoppage of the mine.

(f) The right to hire and discharge, the management of the mine and the direction of the working force are vested exclusively in the operator, and the U. M. W. of A. shall not abridge this right. It is not the intention of this provision to encourage the discharge of employes or the refusal of employment to applicants because of personal prejudice or activity in matters affecting the U. M. W. of A. If any member of the U. M. W. of A. shall be discharged or suspended by the company, and it is claimed that an injustice has been done him, the committee, together with the employe in question, shall present the case to the superintnedent of the mine within ten days. If satisfactory settlement is not made with the superintendent it shall be taken up by the superintendent and the officers of the local, and in case they fail to agree it may be taken up with the manager of the company by the officers of the district within fifteen days thereafter. If the complaint is not brought before the superintendent in writing within ten days, as provided above, it shall not be considered at any time thereafter.

(g) When trouble of a local character arises between the members of the Local Union and their local employers, and they are unable to adjust it satisfactorily locally, it may be referred to the District Executive Board and the manager of the coal com-

pany for settlement. In event of their failure to settle the matter satisfactorily it shall be referred to the National President or the National Executive Board of the U. M. W. of A. and the manager of the coal company. In any event the local shall remani at work until the National President, its Executive Board and the District Executive Board have authorized a strike.

Construction and Extensive Repairs.

Sec. 7. The erection of head frames, buildings, scales, machinery, railroad switches, etc., necessary for the completion of a plant for loading, all being in the nature of construction work, is to be excluded from the jurisdiction of the U. M. W. of A. Extensive repairs to or rebuilding the same class of work shall also be included in the same exception. The employes thereon to be excluded as above when employed on such work only.

Tool Sharpening.

Sec. 8. Where the company does the sharpening the price of blacksmithing shall be one and one-third per cent of the gross earnings, the miners' tools to be given preference over all other work done by the blacksmiths, and tools shall be sharpened in a workmanlike manner.

Penalties for Loading Impurities.

Sec. 9. In case rock, slate, bone, sulphur, or other impurities are sent up with the coal by miner, it shall be the duty of whomsoever the company shall designate as inspector to report same, with the estimated weight thereof, and the miner so offending shall have such weight deducted from established weight of car. For the third, or for any malicious or aggravated cases of the first or any subsequent offenses, the miner may be indefinitely suspended or discharged. Said estimated weight to be determined by an inspector designated by the operator, and who shall be a member of the United Mine Workers of America.

Penalty for Stoppage of Work.

Sec. 10. If any employe or employes shall cause a stoppage of work in violation of this agreement he shall be subject to discharge by the company without recourse.

Preference in Employment.

Sec. 11. In case a member is thrown out of employment he shall be given preference in other mines in same camp operated by the same company.

Repairs and Emergency Work.

Sec. 12. It is definitely understood and agreed that an eight-hour day means eigh hours work in the mine at the usual working place, six days a week when required by the operators, Sundays excepted, but this rule does not apply to those men whose employment requires them to work seven days in the week, or the making of necessary repairs.

In case of urgent necessity the operator can work the mines on Sunday, but New Year's Day, Fourth of July, Labor Day, Thanksgiving and Christmas shall be observed as holidays.

Removal of Water.

Sec. 13. In all places where water accumulates, the same shall be bailed or pumped out by the company.

Delivery of Cars.

Sec. 14. Miners or loaders shall not be required to push their cars more than one hundred feet, and in cases where the roadway is so steep that they cannot push cars, they shall be delivered at the face by the driver. This rule does not affect rooms where the cars are operated by McGintys.

No New Conditions.

Sec. 15. No Local shall be allowed to make any new conditions which conflict with the terms of this agreement until after the expiration of the specified life of the agreement.

Checkweighman.

Sec. 16. Miners may elect a checkweighman, who must be an employe of their mine at the time of and for at least three months previous to his election.

Miners on Other Work.

Sec. 17. A miner taken unwillingly from the face by the company to perform day work shall receive miners' wages for the same as per schedule.

Deaths and Funerals.

Sec. 18. In the event of an instantaneus death by accident in the mine, the miners and underground employes of the entry on which accident accurred shall discontinue work for the remainder of that day; but work, at the option of the opeerator, shall be resumed the day following and continue thereafter. In case the operator elects to operate the mine on the day of the funeral of the deceased, as above, or where death has resulted from an accident in the mine, individual miners and underground

employes may, at their option, absent themselves from work for the purpose of attending such funeral, but not otherwise. And whether attending such funeral or not, each member of the U. M. W. of A. employed at the mine at which the deceased member was employed, shall contribute fifty (50) cents and the operator shall contribute twenty-five (25) dollars for the benefit of the family of the deceased or his legal representatives, to be collected through the office of the company. In the event that the mines are thrown idle on account of the miners' or other employes' failure to report for work in the time intervening between the time of the accident and the funeral, or on the day of the funeral, then the company shall not be called upon for the payment of the twenty-five (25) dollars above referred to.

Except in cases of fatal accidents, as above, the mine shall in no case be thrown idle because of any death or funeral; but in the case of the death of any employe of the company or member of his family, any individual miner may, at his option, absent himself from work for the purpose of attending such funeral, but not otherwise.

Penalty for Absence From Work.

Sec. 19. When any employe absents himself from his work for a period of two days, unless through sickness, or by first having properly arranged with pit boss and obtained his consent, he may be discharged without recourse. All employes whose absence would cause any stoppage of work must, before absenting themselves from work, properly arrange with pit boss for their absence; otherwise they may be discharged without recourse.

Provision for Injured.

Sec. 20. Company will maintain stretchers and blankets to be used in case of accidents in or around the mines.

Man Trips.

Sec. 21. Where man trips are run, these man trips are special privileges accorded employes at their own request, and all employes accepting the benefits of the man trips and riding on the cars assume the risk of accidents and release the company from liability on that account, unless the injuries are wilfully inflicted.

CHESTNUT AND MOUNTAIN SIDE.

Scale of Day Wages—Inside.

	8 Hours.
Miners	$ 3.60
Timbermen	3.60
Timbermen helpers	3.00
Track layers	3.60
Track layer helpers	3.00
Drivers—one or two mules or horses	3.13
Drivers—more than two mules or horses	3.35
Inside rope riders	3.13
Pumpmen	3.00
Bucker boys	2.00
Trappers	1.25
Cagers	3.50
Inside laborers, not otherwise classified.	3.00

Scale of Day Wages—Outside.

Engineers—first-class license	$ 4.00
Other engineers	3.50
First blacksmith, when in charge of other blacksmiths	4.00
Other blacksmiths	3.50
Blacksmith helpers	2.50
Head carpenter, when in charge of other carpenters	4.00
Other carpenters	3.50
Car repairers	3.50
First-class machinists	3.50
Other machinists	3.00
Firemen	3.00
Ashmen	2.50
Weighman	3.50
Assistant Weighman	3.00
First brakeman	3.00
Other brakemen	2.50
Greasers	1.60
Head washery man	3.50
Jigman	3.00
Other washery men	2.50
Boys at picking tables	$1.00 to 1.25

Drill Boys	1.50
Tipple laborers	2.50
Barn boss, per month	90.00
Teamsters	2.50
Outside laborers, not classified	2.50
Outside rope riders	2.50

CHESNUT.

Mining Rates.

Entries, to be paid $3.00 per foot.

Miner to timber entry as directed by mine foreman, and to furnish his own tools and supplies.

The company to take all coal produced, and to deliver at entry face frame timbers and lagging.

Chutes: Rooms will be turned by the company, wages as per schedule.

Mining rates in rooms: $0.85 per car, loaded level full with clean coal. Chutes when finished to be left full of coal.

Building and filling of chutes to be done by the miner.

As a basis for adjusting conditions of chutes between miners taking their places, a fixed valuation of $1.75 in man-way chutes per set, and $2.50 for straight chutes per set is agreed to.

MOUNTAIN SIDE.

Mining Rates.

Entries, $3.00 per foot.

Miner to timber entry as directed by mine foreman, and to furnish his own tools and supplies.

The company to take all coal produced and to deliver at entry face frame timbers and lagging.

Chutes: Rooms to be turned by the company, wages as per schedule.

Mining rates in rooms or chutes: In chutes less than seven feet wide and in cross cuts less than seven feet wide, fifty cents per lineal foot shall be paid, and the miner shall protect the cross cuts and chutes with timber necessary to insure the protection of himself and the working place in his or their care, and also to build and retain their chutes, and the company will deliver all framed and other material necessary at foot of chute. The price paid per ton of two thousand pounds by this company shall be forty cents per ton run of mine ,and sixty cents per ton clean coal. The present basis shall remain until scales

are installed, and company agrees to pay tonnage price quoted.

If, after sixty days' trial, the tonnage prices are found unsatisfactory to either party, a readjustment is to be made locally.

RED LODGE.

Scale of Day Wages—Inside.

	8 Hours.
Miners	$ 3.60
Timbermen	3.60
Timbermen helpers	3.00
Track layers	3.60
Track layer helpers	3.00
Drivers—one or two mules or horses	3.13
Drivers—more than two mules or horses	3.35
Rope riders, main rope	3.50
Rope riders, other ropes	3.13
Car cutters	3.00
Motormen	3.13
McGinty repairer and rope splicer	3.60
Trappers	1.25
Inside laborers, not otherwise classified.	3.00

Scale of Day Wages—Outside.

Engineers—first-class license	$ 4.00
Other engineers	3.50
First blacksmith, when in charge of other blacksmiths	4.00
Other blacksmiths	3.50
Blacksmith helpers	2.50
Head carpenter, when in charge of other carpenters	4.00
Other carpenters	3.50
Car repairers	3.50
Machinists	3.50
Machinists helpers	3.00
Drill boys in shops	1.50
Firemen	3.00
Ashmen	2.50
Head washery man	3.50
Jigmen	3.00
Other washery men	2.50
Weighman	3.50

Assistant weighman	3.00
First brakeman	3.00
Other brakemen	2.50
Greasers	1.60
Pin knockers	2.75
Tipple laborers	2.50
Barn boss, per month	90.00
Assistant barnman, per month	65.00
Outside laborers, not classified	2.50

RED LODGE.

Mining Rates.

Veins No. 4 and No. 5, per ton screened coal	$ 0.75
Vein No. 2, per ton screened coal	.80
Veins Nos. 1, 1½ and 6, per ton screened coal	.90

2,000 Pounds to the Ton.

Crosscuts in rooms and entries, per foot	$0.50
Entries when driven by hand, per foot	1.00
(Entries when driven by machines to be paid no yardage.)	
Room turning	7.50

STOCKETT.

Scale of Day Wages—Inside.

	8 Hours.
Miners	$ 3.60
Timbermen	3.60
Track layers	3.60
Shooters	3.60
Machine runners	3.60
Drillers	3.60
Machine helpers	3.00
Drill helpers	3.00
Machine repairer	3.75
Boss driver	3.75
Drivers—one or two mules or horses	3.13
Drivers—more than two mules or horses	3.35
Pipe foreman	3.50
Pipemen	3.13

Inside engineers	3.13
Parting men	3.13
Rope riders	3.13
Greasers	1.60
Pick carriers	1.60
Trappers	1.25
Barnman	3.50
Inside labor, not classified	3.00

Scale of Day Wages—Outside.

Engineers—first-class license	$ 4.00
Other engineers	3.50
Fan firemen	3.00
Blacksmith, when in charge of others	4.00
Other blacksmiths	3.50
Blacksmith helpers	2.50
Carpenter, when in charge of others	4.00
Other carpenters	3.50
Car repairers	3.50
Machinists	3.00
Drill boys in shop	1.50
Firemen	3.00
Ashmen	2.50
Weighman	3.50
Assistant weighman	3.00
First brakeman	3.00
Other brakemen	2.50
Rope boss	3.75
Rope rider	3.50
Pulley repairer	3.50
Rope cutter	3.00
Couplers	2.50
Greasers	1.60
Barnman, per month	90.00
Assistant barnman, per month	65.00
Teamsters	2.50
Tipple laborers	2.50
Head breakerman	3.50
Other breakermen	2.50
Breaker boss	3.00
Breaker boys	$1.00 to 1.25

Dockman	3.00
Outside laborers, not classified	2.50

Mining Rates.

Section 1. Machine men, 1¾ cents per square foot; machine helpers, 1½ cents per square foot, for all places over 12 feet wide. Machine men, 3 cents per square foot, and machine helpers, 2 cents per square foot, for all places 12 feet wide and under. In deficient places, machine runner to be made up to average of $3.60 per day, and machine helpers to $3 per day. The mine committee and pit boss to decide what is a deficient place.

Sec. 2. Drillers working as partners: Price for coal hole, 12½ cents each; price for rock holes, 20 cents each; price for sump holes, 32½ cents each; price for lifting bottom holes, 20 cents each. Drillers who are working with helpers, 15 cents per coal hole, and helpers 10 cents per hole. The same rates and conditions apply to drillers and drill helpers in making up deficient places as for machine men and helpers.

Sec. 3. Loading coal, 21 cents per ton of 2,000 lbs., run of mine. No loader shall load coal in rooms or entries farther than 15 feet, and loaders shall keep all rock nine feet from the face; where more than the average quantity of rock exists the company shall furnish men to clean such places.

Local Provisions.

Ground rent, per year	$10.00
Coal, at cleaner, per ton	2.00
Lard oil, per gallon	.90
Coal oil, per gallon	.35

Company men to furnish their own tools.

SAND COULEE.

Scale of Day Wages—Inside.

Miners	$ 3.60
Timbermen	3.60
Track layers	3.60
Shooters	3.60
Machine runners	3.60
Drillers	3.60
Machine helpers	3.00
Drill helpers	3.00

Drivers—one or two mules or horses...	3.13
Drivers—more than two mules or horses	3.35
Pumpmen in connection with other work	3.60
Pipemen	3.13
Ditchmen	3.13
Greasers	1.60
Trappers	1.25
Inside labor, not classified	3.00

Scale of Day Wages—Outside.

Engineers—first-class license .....$	4.00
Other engineers	3.50
Fan firemen	3.00
Blacksmith	3.50
Blacksmith helpers	2.50
Carpenter	3.50
Car repairers	3.50
Firemen	3.00
Weighman	3.50
Brakeman	2.50
Couplers	2.50
Greasers	1.60
Barnman, per month	75.00
Tipple laborers	2.50
Dockman in connection with other work	3.50
Outside labor, not classified	2.50

Machine Mining.

Section 1. Machine men, 1¾ cents per square foot; machine helpers, 1½ cents per square foot, for all place over 12 feet wide. Machine men, 3 cents per square foot, and machine helpers, 2 cents per square foot, for all places 12 feet wide and under. In deficient places machine runners to be made up to average of $36.0 per day, and machine helper, $3.00 per day. The mine committee and pit boss to decide what is a deficient place.

Sec. 2. Drillers working as partners: Price for coal hole, 12½ cents each; price for rock hole, 20 cents each; price for sump hole, 32½ cents each; price for lifting bottom holes, 20 cents each; drillers who are working with helpers 15 cents per coal hole, and helpers, 10 cents per hole. The same rates and conditions apply to drillers and drill helpers in making up for deficient places as for machine men and machine helpers.

Sec. 3. Loading coal, 21 cents per ton of 2,000 pounds, run of mine. No loader shall load coal in rooms or entries farther than 10 feet, and pillars no farther than 15 feet, and loaders shall keep all rock 9 feet from the face; where more than the average quantity of rock exists the company shall furnish men to clean such places.

Sec. 4. Pick mining, 70 cents per ton of 2,000 pounds, run of mine, and selected lump, 80 cents per ton of 2,000 pounds.

Sec. 5. Yardage in entries, $2.50 per yard; cross cuts in entries, $2.50 per yard; cross cuts between rooms, 12 feet wide, $1.25 per yard; opening rooms, $6.00.

Local Provisions.

Screened coal, per ton, delivered	$ 2.50
Ground rent, per month	1.00
Tool sharpening, per ton	.01

BRIDGER.

Scale of Day Wages—Inside.

	8 Hours.
Miners	$ 3.60
Timbermen	3.60
Track layers	3.60
Machine runners	3.60
Drivers—one or two mules or horses	3.13
Machine helpers	3.00
Rope riders, main rope	3.50
Rope riders, other rope	3.13
Inside engineers	3.13
Inside laborers, not otherwise classified	3.00

Scale of Day Wages—Outside.

Engineers—first-class license	$ 4.00
Other engineers	3.50
Blacksmith	3.50
Carpenter	3.50
Firemen	3.00
Ashmen	2.50
Weighman	3.50
Brakemen	2.50
Tipple laborers	2.50
Barnmen, per month	70.00
Outside labor, not otherwise classified	2.50

Mining Prices.

Per ton of 2,000 pounds, screen lump....$ .90

Local Provisions.

The company shall deliver the cars at entrance of each room.

House coal shall be delivered in the camp to all employes of the Bridger Coal Company at $2.50 per ton.

GEBO.

Scale of Day Wages—Inside.

Miners .....$	3.60
Timbermen	3.60
Track layers	3.60
Machine runners	3.60
Drivers—one or two mules or horses...	3.13
Machine helpers	3.00
Rope rider	3.50
Inside laborers, not otherwise classified.	3.0c

Scale of Day Wages—Outside.

Engineers—first-class license .....$	4.00
Other engineers	3.50
Blacksmith	3.50
Carpenter	3.50
Firemen	3.00
Weighman	3.50
Brakeman	2.50
Tipple laborers	2.50
Outside laborers, no otherwise classified	2.50

Mining Prices.

Per ton of 2,000 pounds, screen lump....$	0.85
Machine mining entries, per ton.....	1.00

STORRS.

Scale of Day Wages—Inside.

Miners .....$	3.60
Timbermen	3.60
Timbermen helpers	3.00
Track layers	3.60
Track layer helpers	3.00
Parting men	3.13
Drivers—one or two mules or horses...	3.13
Drivers—more than two mules or horses	3.35

Pipemen	3.13
Trappers	1.25
Drillers	3.60
Driller helpers	3.00
Inside labor, unclassified	3.00
Pumpman	3.60

Scale of Day Wages—Outside.

Engineers—first-class license	$ 4.00
Other engineers	3.50
First blacksmith, when in charge of other blacksmiths	4.00
Other blacksmiths	3.50
Blacksmith helpers	2.50
Head carpenters, when in charge of other carpenters	4.00
Other carpenters	3.50
Car repairers	3.50
Weighmen	3.50
Machinists	3.00
Firemen	3.00
Ashmen	2.50
Jigmen	3.00
Other washermen	2.50
Barnmen, per month	90.00
Assistant barnmen, per month	65.00
Tipple laborers	2.50
Cokeman	2.50
Outside drivers	2.75
Outside labor, classified	2.50

Mining Rates.

All coal 3¾ feet and over in thickness shall be paid for at the rate of 60 cents per ton of 2,000 pounds. Miners will take all timbers from the mouths of the rooms and set them up. It is understood that 3¾ feet of coal means actual coal, exclusive of rock.

Crosscuts and all places under 10 feet in width, also room necks, shall be paid for at the rate of 50 cents per lineal foot in addition to the coal. When crosscuts exceed 25 feet in length they shall be paid for at the rate of 75 cents per lineal foot.

Counter-entries shall be paid for at the rate of 50 cents per

lineal foot in addition to the coal, where square sets and lagging are not required. In the event of square sets being used the counter-entries shall be paid for at the rate of 75 cents per lineal foot.

All timber material will be placed at the mouth of rooms by the company when required, and a bulletin board shall be placed at the mouth of the mine so that miners can leave orders for material when required.

The company will load all the coal from the chutes, and will also pay for the building of the chutes.

Crosscuts shall be driven in rooms not more than 60 feet apart.

All deficient places shall be driven at a price to be decided upon between the pit boss and the miners working in these places, provided an agreement can be reached that is satisfactory to both parties. In the event of no agreement being reached the miners shall be provided with other places in the mine, if any such are available, and the company shall then have the privilege of further driving the deficient places, either by special contract with other miners or by day work, as they see fit. It is agreed that no miner shall be discharged on account of failing to agree upon a price for deficient work.

BELT.

Scale of Day Wages Inside.

	8 Hours.
Miners	$ 3.60
Timbermen	3.60
Timbermen helpers	3.00
Track layers	3.60
Track layer helpers	3.00
Machine runners	3.60
Machine helpers	3.00
Pipe foreman	3.50
Pulley repairers	3.50
Rope riders, main rope	3.50
Rope riders ,other ropes	3.13
Parting men	3.13
Drivers—one or two mules or horses	3.13
Drivers—more than two mules or horses	3.35
Pipemen	3.13

Inside engineers	3.13
Greasers	1.60
Trappers	1.25
Inside labor, unclassified	3.00

Scale of Day Wages—Outside.

Engineers—first-class license	$ 4.00
Other engineers	3.50
First blacksmith, when in charge of other blacksmiths	4.00
Other blacksmiths	3.50
Blacksmith helpers	2.30
Head carpenter, when in charge of other carpenters	4.00
Other carpenters	3.50
Car repairers	3.50
Weighmen	3.50
Machinists	3.00
Firemen	3.00
Ashmen	2.50
Head car dropper	3.00
Other car droppers	2.50
Greasers	1.60
Jigmen	3.00
Other washermen	2.50
Waste dumpman	2.50
Barnmen, per month	90.00
Assistant barnmen, per month	65.00
Tipple laborers	2.50
Oilers	2.75
Wipers	2.75
Cokemen	2.50
Outside labor, unclassified	2.50

Mining Rates.

In all places in the mine where the vein is over five feet in thickness the following prices will be paid:

Pick miners, 70 cents per ton of 2,000 pounds.

Loaders, 35 cents per ton of 2,000 pounds.

Machine operators, 7 cents per ton of 2,000 pounds.

Machine helpers, 5 cents per ton of 2,000 pounds.

In all places in the mine where the vein is less than five feet

in thickness the following prices will be paid:

Pick miners, 80 cents per ton of 2,000 pounds.

Loaders, 41 cents per ton of 2,000 pounds.

Machine operators, 9 cents per ton of 2,000 pounds.

Machine helpers, 7 cents per ton of 2,000 pounds.

In the event of the company desiring the machine men to cut higher than the usual height of undermining, the cut shall be made so as to be eight inches high at the back of the cut and the coking coal will be paid for at the following prices:

Loaders, 35 cents per ton of 2,000 pounds.

Machine operators, 12 cents per ton of 2,000 pounds.

Machine helpers, 8 cents per ton of 2,000 pounds.

It is agreed that the loaders will load the minings out separately from the rest of the coal, and after shooting down the rest of the coal will load the upper coal out separately as mine run, then remove the slate from the balance of the coking coal, and load the said coking coal separately, marking the cars of coking coal in the manner prescribed by the company, so that they can be distinguished from the mine run.

COKEDALE.

Scale of Inside Wages.

	8 Hours.
Miners	$ 3.60
Timbermen	3.60
Timbermen helpers	3.00
Track layers	3.60
Track layers' helpers	3.00
Drillers	3.60
Drillers' helpers	3.00
Drivers—one or two mules or horses	3.13
Drivers—more than two mules or horses	3.35
Inside engineers	3.13
Pumpmen	3.60
Trappers	1.25
Inside labor, unclassified	3.00
Pipe foreman	3.50
Pipeman	3.13

Scale of Day Wages—Outside.

Engineers, first-class license	$ 4.00
Other engineers	3.50

Blacksmith	3.50
Blacksmith helper	2.50
Head carpenter, when in charge of other carpenters	4.00
Other carpenters	3.50
Machinist	3.00
Firemen (12 hours)	3.00
Ashmen	2.50
Dinkey engineers	3.00
Jigmen	3.00
Other washermen	2.50
Barnmen, per month	75.00
Triple laborers	2.50
Cokemen	2.50
Outside labor, unclassified	2.50

Mining Rates.

Conditions and prices to remain as at present until such time as the mine is operated under normal conditions, when a rate will be established between the management of the mines and the District and Local officers of the U. M. W. of A.

On behalf of the COAL MINE OPERATORS—

H. J. HORN,

General Manager Coal Department Northwestern Imprevement Company in Montana.

LEWIS STOCKETT,

Manager Cottonwood Coal Company.

F. W. C. WHYTE,

General Manager Coal Department Anaconda Copper Mining Company in Montana, and Coke Department Washoe Copper Company in Montana.

ED. GERBER,

Manager Rock Springs Coal Company.

A. O. NELSON,

Manager Nelson Coal Company.

GEO. G. HOUGH,

Manager Bridger Coal Company.

GEO. H. HILL,

Manager Cokedale Coal Company.

H. H. GRIFFITH,

Manager Gebo Coal Company.

CHARLES LOCHRAY,
On behalf of the UNITED MINE WORKERS OF AMERICA,
JOHN MORTON,
President District No. 22.
THOMAS BURKE,
Member of National Board.
W. J. MURRAY,
Secretary-Treasurer District No. 22.

A Bituminous-Coal Breaker.

During the year 1903 a building and machinery corresponding to an anthracite-coal breaker was erected at the town of Stockett, Cascade County, Montana, for the purpose of breaking up and cleaning bituminous coal.

The coal is mined from a vein of the Kootenai group of the Lower Cretaceous measures having the following section:

	Feet	Inches	Feet	Inches
Sandstone ledge				
Top coal	1	2		
Slate			0	5
Top bench	1	6		
Bone			0	7
Gray coal	1	3		
Blacksmith coal	2	5		
Bone			0	6
Coking coal	1	5		
Metamorphosed fire clay				
Total—				
Refuse	7	9		
Coal			1	6
			9	3

The vein is nearly horizontal in position, and each bench differs in quality as shown in Table I.

TABLE I.—Analysis and Specific Gravity of Stockett Coals

	Moisture Per Cent	Volatiles Per Cent	Fixed Carbon Per Cent	Ash Per Cent	Sulphur Per Cent	Specific Gravity
Top coal	4.35	30.90	54.90	9.85	2.56	1.29
Top bench	2.85	28.95	53.45	14.75	1.64	1.29
Gray coal	3.05	25.10	51.55	20.30	1.33	1.75
Blacksmith coal	2.65	35.85	51.35	10.30	1.45	1.29
Coking coal	3.01	29.55	52.09	15.35	1.92	1.44

There are no partings whatever between the different benches of coal, slate and bone, the vein being very hard and a solid mass from top to bottom, which with a liberal number of pyrite nodules, called sulphur-balls, scattered promiscuously throughout the vein, make the coal a difficult one to clean. Previous to the building of the breaker, the cleaning was done with indifferent results by the miner at the face, and the nut-coal was washed in a jig. Scarcity of water, however, prevented the

erection of a plant to wash the whole product, and at times necessitated the shutting down of the nut-coal washer.

The difficulties to be overcome in separating the different material of the vein will be appreciated by a study of their specific gravities, shown in Table II.

Table II.—Specific Gravity of Material Mined at Stockett.

Sulphur balls	4.140	Gray coal,	1.5 to 1.751
Slate	2.402	Coking coal	1.440
Bone	1.963	Other coal	1.290

After a series of experiments, a scheme of treatment supplementary to the cleaning by the miner was determined upon and carried out, one of the requirements being so to connect the new work to the old tipple that the change could be made from one to the other without delay in the shipment of coal. This arrangement was successfully accomplished and accounts for some things about the building that may be open to criticism,—things which would be arranged differently in an entirely new plant. Ground was broken for the foundations of the building, March 26, 1903, the timber-work was commenced April 16, the machinery started August 10, and has since been in continuous operation every week-day with gratifying results.

The following illustrations have been prepared from the working-drawings to show the general arrangement of the plant and the manner in which the machinery has been installed:—Fig. 1. Ground plan; Fig. 2. Longitudinal section showing especially the machinery; Fig. 3. Transverse section showing the machinery; Fig. 4. Transverse section showing the bins; Fig. 5. Plan at the screens; and Fig. 6. Section of the tipple. The letters in the text of this paper, referring to the legends, are common to all of the illustrations.

The coal, carried from the mine in pit-cars of a capacity averaging about 1.5 tons to the car, is weighed on an automatic scale and thence dumped by the crossover tipple A, over the bar-screen B, 12 feet long, 6 feet wide and having a pitch of 6 inches to the foot with spaces between the bars 2 inches wide, which screens out that portion already small enough (about 30 per cent of the total), and, falling on the shaking screen C, havin 1-inch round perforations, 6-inch throw and 100 strokes per minute, removes the slack from the coal. The slack is loaded directly in the railroad car or taken to the boiler-rom by means of a wire-

rope conveyor. The portion of the coal that goes over the shaking-screen C slides into a hopper D, from which it feeds into an elevator E, consisting of a rubber belt 16 inches wide, having 8- by 14-inch buckets placed every 16 inches and operated with a speed of 225 buckets per minute, which elevates the material to the top of the building.

The coal that passes over the screen B falls upon a traveling belt F, 4 feet 6 inches wide and 26 feet long, having a speed of 33 feet per minute; and from this belt any large pieces of slate or other impurities, machine-picks, car-couplings, sprags, etc., are removed by men stationed on either side and thrown into a rock-elevator G. This traveling band is operated by a clutch gear H, which in case of a very lage quantity of impurities appearing is thrown out, the belt stopped and all of the impurities removed before the coal drops into the rollers I, which reduce the coal to a size not exceeding a 4-inch cube. It was found necessary to reduce to a 4-inch size in order to prevent the concealment of a sulphur ball in a lump of coal. The rollers are of the removable-tooth style, 36 inches in diameter, 48 inches wide and revolve at 75 revolutions per minute.

From the rollers the coal is elevated by a continuous elevator J, having buckets 12 by 30 inches, and operated at a speed of 65 buckets per minute. Each bucket has a capacity of 110 lb. of coal when level-full, which is equivalent to 200 tons per hour; the capacity of the fine-coal elesator E is 90 tons per hour, giving a combined elevating-capacity of 290 tons per hour, or 2,900 tons per day of 10 hours, an amout which added to the slack screened out at C gives a total capacity of 3,200 tons per day.

The coal elevated by the elevators, E and J, is evenly divided over the shaking screens K, 5 feet wide and 46 feet long, having a 3-inch pitch to the foot, a 6-inch throw and 100 strokes per minute. The plates of the screens have respectively 1-, 1.5-, 2-, 2.5- and 3-inch round perforations, and separate the coal into slack, pea-, nut-, stove-, egg- and broken-sizes.

The slack resulting from the breakage of the coal is found to be clean, and, not needing any further preparation, it descends through the hopper L to the top strand of the conveyor M (having 10- by 20-in. flights spaced every 3 feet), and taken directly to the mixed-coal bin S. The other sizes are fed by means of the hoppers N into spiral separators O, which separate

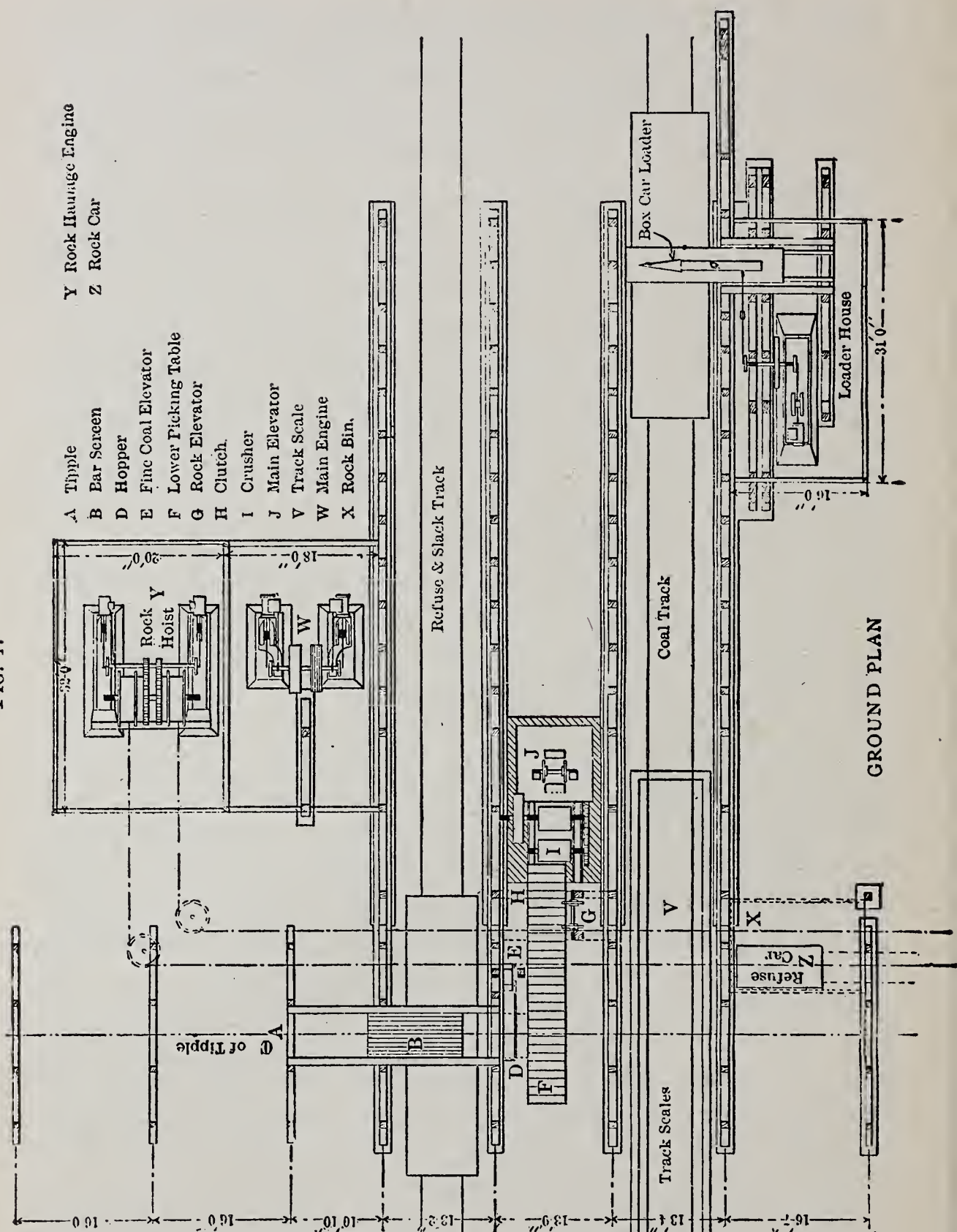

A Tipple
B Bar Screen
D Hopper
E Fine Coal Elevator
F Lower Picking Table
G Rock Elevator
H Clutch.
I Crusher
J Main Elevator
V Track Scale
W Main Engine
X Rock Bin.
Y Rock Haulage Engine
Z Rock Car
Rock Hoist
Refuse & Slack Track
Coal Track
Box Car Loader
Loader House
Track Scales
Refuse Car
Center of Tipple
GROUND PLAN

FIG. 1.

the greater part of the impurities from the coal. These impurities pass either to the lower strand of the conveyor M and are conveyed to the rock elevator G, or from one set of spirals

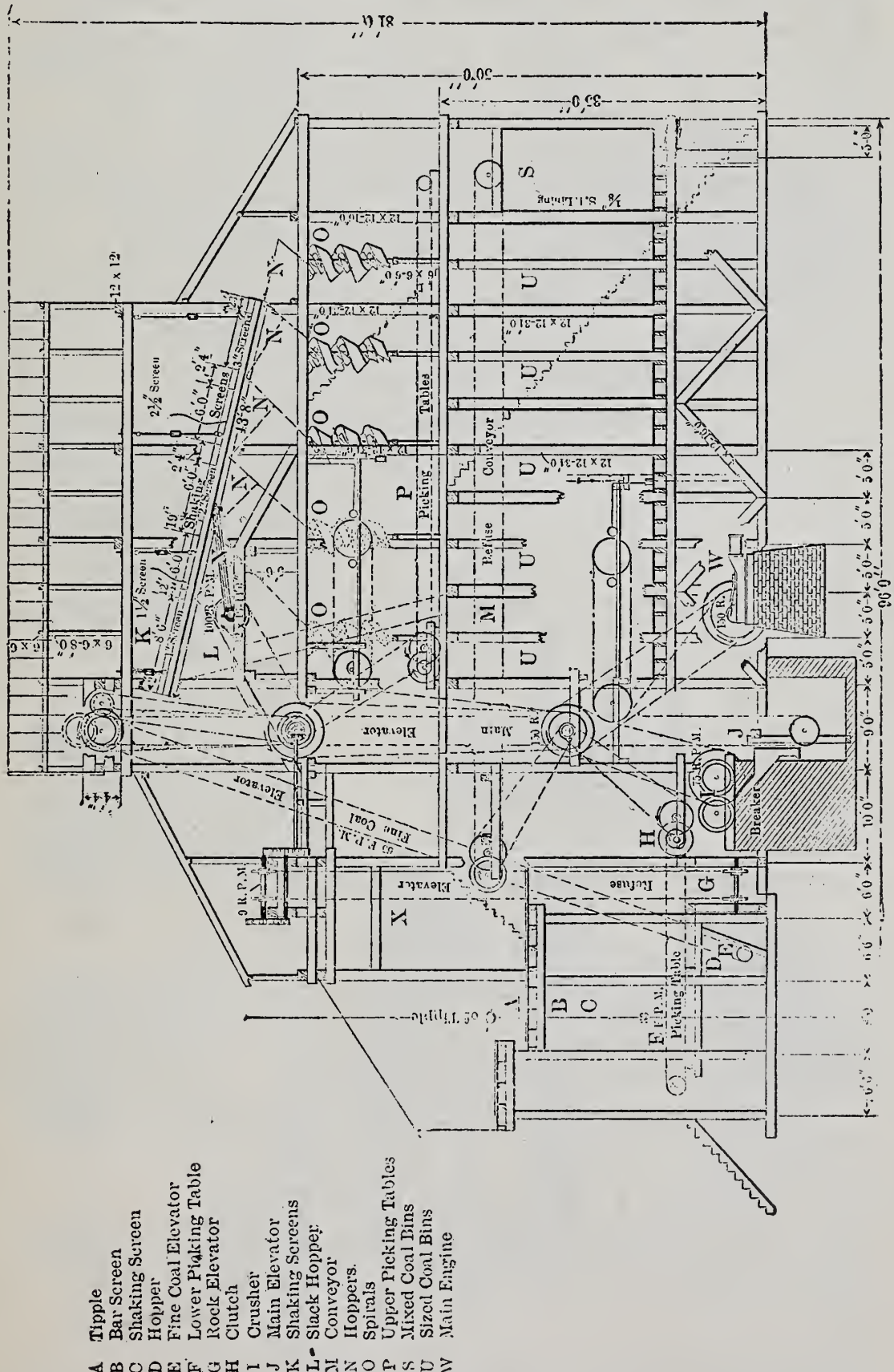


FIG. 2.

to the bins R, by means of chutes Q, which give an opportunity to re-pick the refuse by hand and save any coal that may be in

it. The refuse is finally loaded into railroad-cars and used by the railroad for widening banks, etc.

FIG. 4.

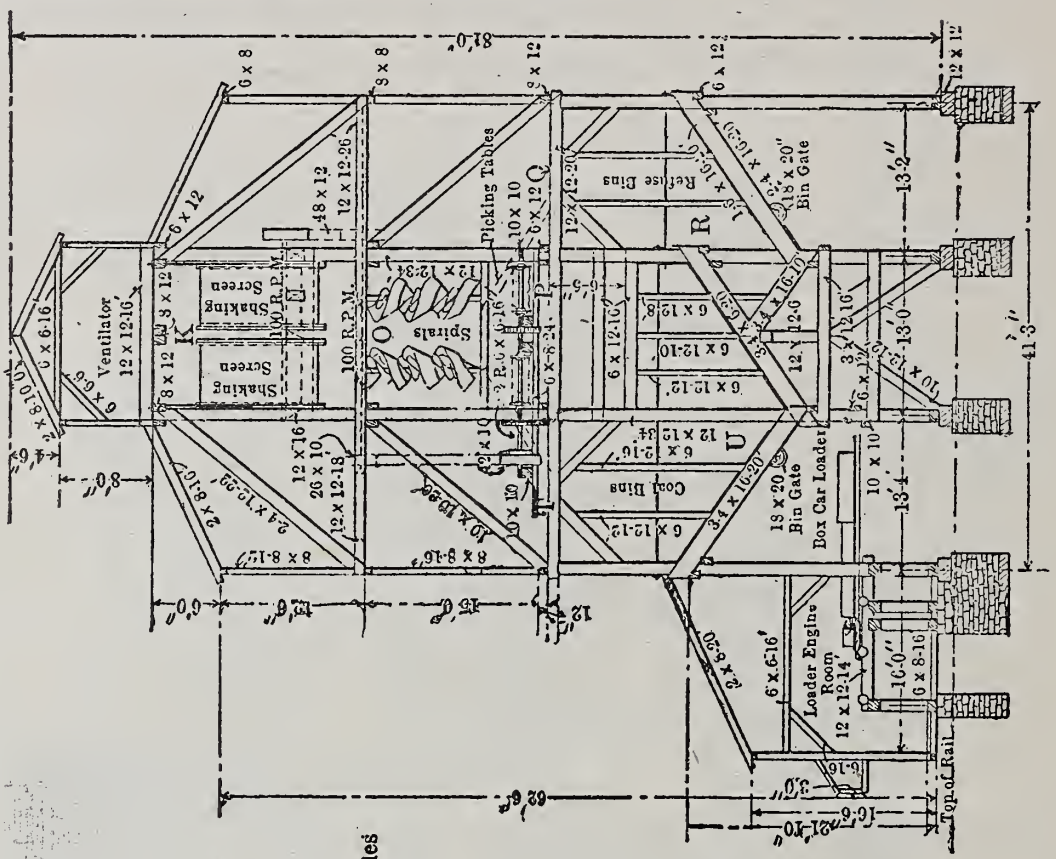
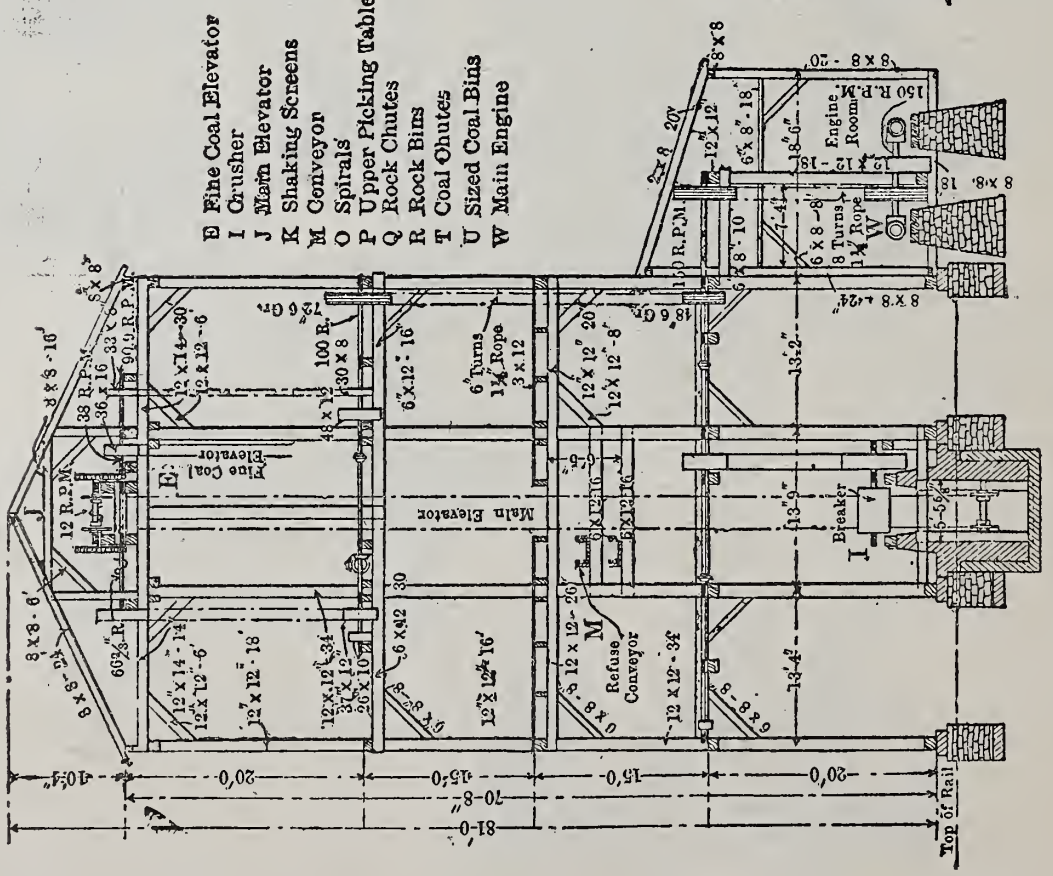


FIG. 3.



From the spirals O the coal drops onto two picking bands P, 4 feet wide, 50 feet long and having a speed of 40 feet per minute, which convey it to the mixed-coal bin S and gives an oppor-

FIG. 6.

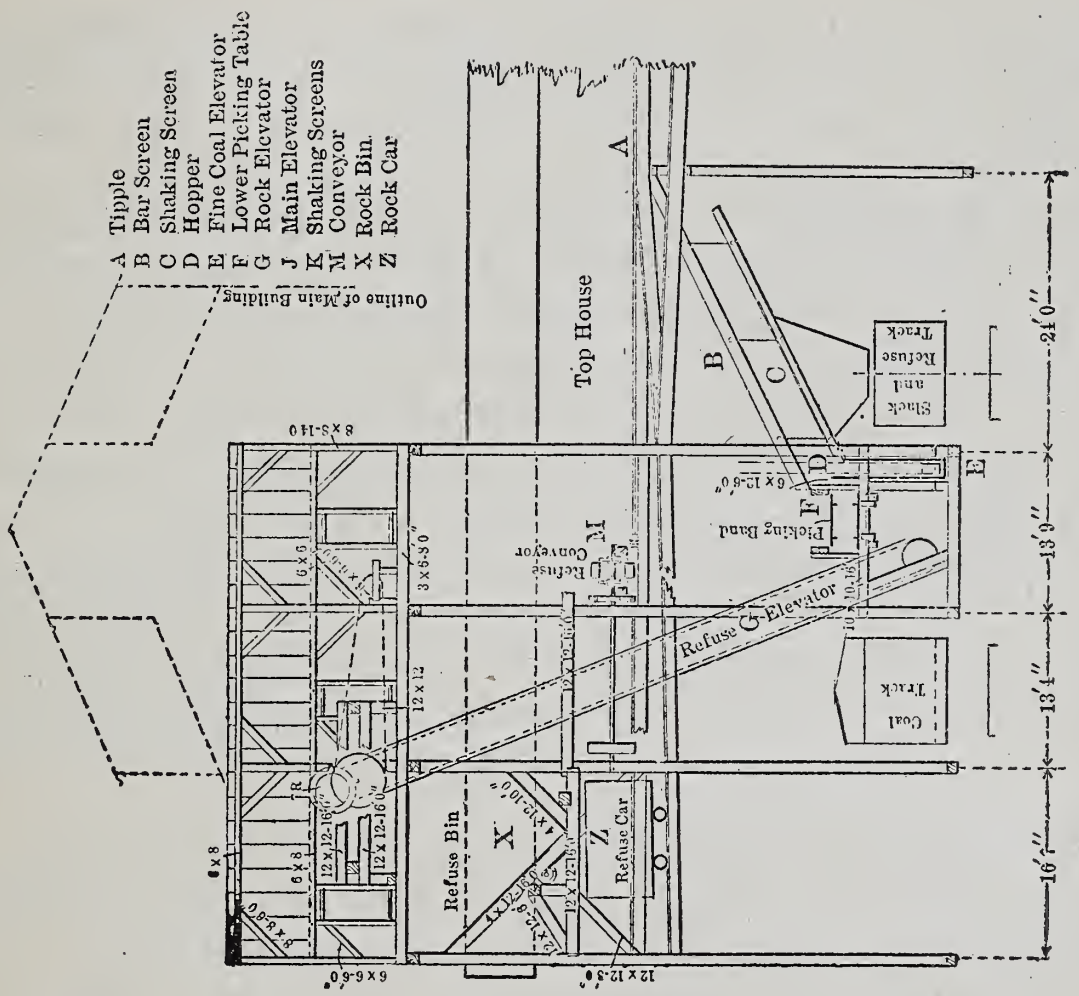
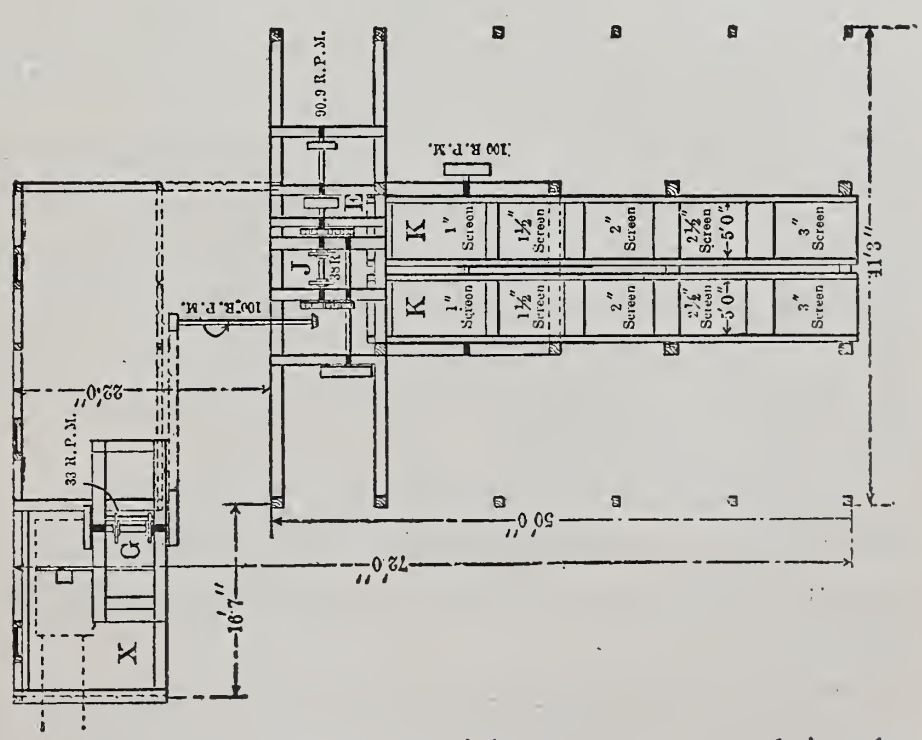


FIG. 5.



tunity to pick out by hand any impurities not removed in the spirals; from one set of spirals, inclined shutes T pass the coal

into bins U for loading straight sizes, any remaining impurities being removed by hand while the material is on these chutes.

The rock elevator G, having continuous buckets 12 by 30 in., and speed 50 buckets per minute, elevates the impurities into a bin X, from which it is loaded into a 6-ton car and hoisted by a pair of geared tail-rope engines, with 10- by 18-inch cylinders, to the top of the adjoining hill and automatically dumped.

The machinery of the entire plant is driven by a double engine W, with cylinders 13 by 18inch, running 150 rev. per min.; the conection to the first and second line-shafts being made by rope drives, and all other connections, of rubber belts.

From the bins S and U the coal is loaded into railroad cars, a box-car loaded being placed opposite the chute S, to load box-cars. The cars are weighed on the scale V, and it may be of interest to know that, when loading the mixed-coal into box-cars, the entire praduct of the breaker passes through an opening 12 by 14 inches in area.

The building is heated by steam-coils supplied with live steam, and is lit by incandescant electric lights. It has two stand-pipes with hose-connections and hose for fire-protection.

On account of the slight difference in the specific gravity of the gray coal and the bone, the spirals are adjusted so as to retain only the slate and flat sulphur balls, leaving the bone to be removed by hand. The round sulphur balls which on account of their shape are the first to leave the spirals and go with the coal, also have to be removed by hand.

The result obtained are given below, showing the percentages of refuse in the various sizes:—In pea coal, 4; in nut coal, 3; in stove coal, 3; in egg coal, 2; in broken coal, 1; and in mixed coal, 2.5 per cent. Of 2,000 tons of the mine-product, which is daily dumped into the breaker, 200 tons of the various impurities are removed, and these impurities do not contain on an average over 1 per cent of coal.

The mixed coal is used by the railroads as a locomotive-fuel, and proves an excellent article; the various sizes are used in the commercial trade, the slack and pea-sizes making the very best of boiler-fuel.

The cost of the breaker, in the section where the highest wages are paid in the United States and where freight is a very large item was $42,517.90, divided as follows:

General expense	$472.45	Scale	$123.75
Foundations	2,445.46	Hardware	805.91
Lumber	3,607.31	Labor	10,700.82
Machinery	12,764.89	Freight	8,844.13
Separators	2,753.18		
		Total	$42,517.90

The above figures include 300,000 feet of lumber and 400 yards of masonry as well as duplicate pieces for all of the parts of the machinery that are liable to break or wear out.

The cost of operation of the plant over and above the force previously used on the old tipple is as follows:

Coal inspector on lower picking band	$3.00	1,500 tons (1,800 less 300 slack) per ton	0.03
3 men on lower picking band	7.50	To which add interest on investment, taxes insurance, wear and tear, supplies used and repairs, which as near as can be estimated is	0.03
1 man looking after screens	2.50		
1 man looking after spirals	3.00		
15 boys picking slate, etc	15.00		
1 breaker boss	3.00		
1 engineer, also hoists the rock	4.00		
1 machinist, oils and keeps machinery in order	3.50	Total additional cost per ton	0.06
1 man loading rock	2.50		
	$44.00		

The largest item of cost, however, comes from the decreased produced from what was formerly shipped, by reason of the removal of the impurities; the total cost being now divided by 1,500 tons of lump-coal as compared with 1,700 tons formerly; this is met by the increased price received for the coal, and which at the increased price is a cheaper fuel to the consumer than the former product at the lower figure.

The success of this plant will make available large fields of coal in Montana, which on account of the impurities present were hitherto regarded as unworkable. However, it is only with coals hard enough to keep their shape, and where a marked difference exists both in the specific gravity and the shape of the coal and the impurities, that the spirals will work successfully.

Mining Laws.

Laws of Montana Relating to Coal and Coal Mining.

SENATE BILL NO. 106.

Session Laws of 1901.

An Act Entitled An Act creating the Office of Inspector of Coal Mines, defining his duties, and providing his salary and providing penalties thereof.

Be it Enacted by the Legislative Assembly of the State of Montana:

Section 1. The Governor, by and with the advice and consent of the Senate, shall appoint one coal mine inspector who shall hold office for the term of four years from the date of his appointment unless otherwise removed by the Governor.

Sec. 2. No person shall be eligible to the office of coal mine inspector until he shall have attained the age of 30 years, and been actually employed at coal mining ten years prior to his appointment, and shall posses a competent knowledge of all the different systems of coal mining and working and properly ventilating coal mines, and the nature and constituent parts of noxious gases of coal mines, and of the various ways of expelling the same from said mines. Said inspector shall be a graduate of some recognized school of mines and mining engineering, and hold a diploma from same, which shall be deposited with the Governor before appointed; and further it shall be the duty of the said inspector, when not engaged in examining coal mines, to inspect quartz mines if called by the Governor to do so.

Sec. 3. Said coal mine inspector shall before entering upon and discharging the duties of his office, take an oath to faithfully discharge the same in an impartial manner; and for the faithful performance thereof; he shall receive a salary of two thousand dollars per annum, and all other and necessary traveling expenses.

Sec. 4. It shall be the duty of the said coal mine inspector to carefully examine all coal mines that may be in operation in this state at least once every two months and oftener if necessary, to see that every percaution is taken to insure safety to all work-

men that may be engaged in said coal mine, and to see that provisions of Sections 3350, 3351, 3352, 3353, 3354, 3355, 3356, 3357, 3358, 3359, 3360, 3361, 3362, 3363, 3364 and 3365, Chapter 20, Article 1, Part 3, Title 7, of the Political Code of Montana pertaining to the regulation of coal mines are strictly observed; and all other legislation that may be enacted governing coal mines, and it shall further be the duty of the said coal mine inspector after being notified by a justice of the peace, or coroner, in the district wherein accidents may occur to immediately investigate the same.

Sec. 5. The said coal mine inspector while in office shall not act as agent for any corporation, superintendent or manager of any mine, and shall in no manner whatever be under the employ of mining companies, and it shall be the duty of the said coal mine inspector on or before the first day of January in every year to make a report to the Governor, of his proceedings as such coal mine inspector, and the conditions of each and every coal mine in the State, stating therein all accidents that may have happened in or about said mine, and to set forth in said report all such information that may be proper and beneficial and also to make such suggestion as he may deem important as to any further legislation on the subject of coal mining.

Sec. 6. It is the duty of the inspector of coal mines to visit, enter and examine any coal mine in the State for the purpose of ascertaining the conditions of the same in regard to its safety, ventilation and means of egress, and for this purpose he must have access at any and all times to any mine in the State for the purpose of inspection, but the working of such mine must not be obstructed or impeded during such examination; the inspection must not be at the expense of the owner, lessor, lessee, or agent of the mine being examined, but they must render such assistance as may be necessary to enable the inspector to make the examination.

Sec. 7. This Act shall be in force and effect from and after its passage and approval.

Approved March 18th, 1901.

REGULATION OF COAL MINES.

Political Code.

Sec. 3350. The owner or operator of any coal mine in the State must make, or cause to be made, an accurate map or plan of the mine, which must exhibit the openings or excavations, the shafts, slopes, or tunnels, the entries, rooms, or other workings, must show the direction of the air currents therein, accurately delineate the surface section lines of the coal lands controlled by the owner of said mines and show the exact relation to and proximity of the workings of said mine to said surface lines; said map, or plan, must also show the exact date of each survey made, and indicate the boundary line of the most advanced face of the workings at such date; and in case more than one seam of coal is opened or worked, a separate map or plan as aforesaid, must, if desired by the Inspector, be made of the working in each seam. The map, or plan, or a true copy thereof, with the record of all surveys of said boundary lines and underground workings, must be delivered to the State inspector of mines, and the original or a true copy of the same must be retained for reference and inspection at the office of the coal mine. The maps and plans so delivered to the Inspector of Mines are the property of the State, and must be transferred to his successor in office. Maps of mines filed with the Inspector must be open to the examination of the public in the presence of the inspector, but in no case must any copy of the same be made without the consent of the owner, operator, or his agent.

Sec. 3351. After the maps and plans herein provided are completed, thereafter in July of each year, the owner or operator of every coal mine must cause surveys to be made of all alterations and extensions of the workings made during the year preceding, and must have the records and results of the survey duly entered upon the maps of the inspector, and upon that kept at the mine. The said extensions must be placed upon the In-

spector's map, and the map returned to the inspector within thirty days from the completion of the survey. When any coal mine is worked out, and is about to be abandoned the owner or operator must have the maps or plans thereof extended to include all the excavations made showing the most advanced workings of every part of the mine and the relation of such boundaries to marked boundaries on the surface.

Sec. 3352. Whenever the owner or operator of any coal mine neglects or refuses to furnish the inspector the map or plan of such coal mine, or the extensions thereto, as provided for in this Chapter, the inspector is authorized to make, or cause to be made, an accurate map or plan of such coal mine, at the expense of the owner, and the cost may be recovered from the owner or operator, in the same manner as other debts, in the name of the State.

Sec. 3353. For all coal mines in this State, when more than six men are employed, other than the owners or operators of such mine, whether worked by shaft, slope or drift, there must be provided and maintained in addition to the hoisting shaft or opening, a separate escapement shaft or opening to the surface, or an underground opening or communication between every such mine and some other contiguous mine, as may be approved by the Mine Inspector, as coming within the requirements of this Chapter, which openings constitute two separate and available means of ingress and egress to all persons employed in the mine, and all passage-ways communicating with the escapement shafts must be at least five feet wide and five feet high.

Sec. 3354. Every escapement shaft must be separated from the main shaft by such extent of natural strata as shall secure safety to the men employed in such mines, and provided with either stairways, or cages and hoisting apparatus, as in the judgment of the inspector of mines may be sufficient to insure the safe and speedy removal of all persons within the mine in case of danger. No obstructions of any kind must be permitted in any escapement shaft that would in any way impede travel through the same. The time allowed for completing such escapement shaft or making such communication with an adjacent mine, as is required by the terms of this Chapter, is for all mines already opened or in process of development on the sixth day of March, 1891, one year for sinking any shaft two

hundred feet or less in depth, and one additional year or pro rata portion thereof for every additional two hundred feet, or fraction thereof; but for mines which are opened thereafter the time allowed shall be two years for all shafts more than two hundred feet in depth, and one year for all shafts two hundred feet or less in depth, and the time must be reckoned in all cases from the date on which coal is first hoisted from the original shaft for sale or use, and it is the duty of the inspector of mines to see that all escapement shafts are begun in time to secure the completion within the time herein specified.

Sec. 3355. The owner or operator of every coal mine, whether operated by shaft, slope or drift, must provide and maintain for every such mine a good and sufficient amount of ventilation for men and animals employed therein; the amount of air in circulation to be in no case less than one hundred cubic feet for each man, and six hundred cubic feet for each animal per minute, measured at the foot of the down cast, and the same to be increased at the discretion of the inspector according to the character and extent of the workings, or to the amount of powder used in blasting ,and the volume of air must be forced and circulated to the face of every working place throughout the mine, so that the mine is free from standing powder smoke and gases of every kind. All doors set on main entries for the purpose of conducting ventilations must be so constructed and hung as to close of themselves when opened, and must be made sufficiently tight to effectually obstruct the air currents.

Sec. 3356. In all the larger mines, a suitable person as doorkeeper must be kept in attendance upon such doors, to see that they are kept securely closed and the air currents properly controlled. Whenever the inspector finds men working without sufficient air or under any unsafe conditions, he must first give the owner or poerator a reasonable notice to rectify the same; upon the neglect or refusal of the owner or operator of the mine to put the same in a safe condition, as required by the inspector, the inspector must proceed by an action to enjoin the further workings of the mine until the law is complied with. All actions for an injunction must be brought by the county attorney, or by the Attorney General in the name of the State.

Sec. 3357. All mines in which explosive gases are known to exist must be examined every morning by a duly authorized

agent of the owner or operator, to determine whether there are any dangerous accumulations of gases or lack of ventilation or obstructions to roadways or any other dangerous conditions and no person must be allowed to enter the mine until the agent has reported all the conditions safe for beginning work; the agent must maye a daily record of the conditions of the mine in a book kept for that purpose, which shall be open at all times to the examination of the inspector. The current of air in mines must be split, to as to give a separate current to at least every one hundred men at work, and the inspector has the discretion to order a separate current for a smaller number of men if special conditions render it necessary. In case the entries or roadways of any mine are so dry as to become filled with dust, the owner or operator of the mines is required to have such roadways regularly and thoroughly sprinkled and it is the duty of the inspector to see that in all mines every practicable precaution is taken against accident from the careless handling of powder within the mine.

Sec. 3358. In no case must more powder be stored in the mine at any one time than in the discretion of the inspector is necessary for each day's use. It is unlawful for coal miners in any mine to charge a blasting hole with the loose powder or otherwise than with the properly constructed cartridge; and in dry and dusty mines it is unlawful to load cartridges in the mines except with powder cans constructed for that purpose. It is unlawful for the owner or operator of any mine to permit miners to work in said mines with tools prohibited by law. It is unlawful for any owner or operator of any mine where dangerous or explosive gases are known to exist to employ any person as foreman or boss of said mine, who does not possess a thorough, practical knowledge of the nature and danger of inflammable or explosive gases and understand the means and appliances for controlling them.

Sec. 3359. It is unlawful for any person to act as foreman or mine boss of any mine in which inflammable gases are known to exist who does not possess a certificate from the state mine inspector certifying to his competency for managing the underground workings of mines, together with a thorough knowledge of all gases met with in coal mines and of the most approved means of appliances for controlling them, and the in-

spector of mines is authorized to examine all foremen or mine bosses upon their competency under the provisions of this Chapter and issue his certificate to those whom he considers qualified to act as such foreman or boss within the meaning of this law. It is unlawful for any owner or operator of a coal mine to employ persons underground whose duties may involve contact with inflammable gases or the handling of explosives, who have not had experience in such duties, unless all such employes are placed under the immediate charge and instruction of such number of competent men as to secure the safety of other persons employed in the same mine.

Sec. 3360. The ventilation required by this Chapter may be produced by any suitable appliances, but in case a furnace is used for ventilating purposes it must be built in such a manner as to prevent the communication of fire to any part of the works by lining the upcast with incombustible material for a sufficient distance up from the furnace. It is unlawful to use a furnace for ventilating purposes or for any other purpose that emits smoke into any compartment constructed in or adjoining any hoisting shaft or slope where the hoisting shaft or slope is the only means provided for the ingress or egress of persons employed in said coal mines. It is unlawful where there is but one means of ingress and egress provided at a coal shaft or slope to construct and use a ventilating furnace that emits smoke into a shaft as an upcast where the shaft or slope as a means of ingress and egress by persons employed in said coal mines is the only means provided for furnishing air for persons employed therein.

Ses. 3361. The owner or operator of a coal mine operated by shaft must provide safe means of hoisting and lowering persons in a cage covered with boiler iron, so as to keep safe as far as possible persons descending into and ascending out of said shaft, and said cage must be furnished with guides to conduct iron slides through such shaft, with a sufficient brake on every drum to prevent accident in case of the giving out or breaking of the machinery; and such cages must be furnished with safety catches intended and provided as far as possible to prevent accident in case of cable breaking or the loosening or disconnecting of machinery. The owner or operator of every coal mine operated by shaft and steam power must place competent per-

sons at the top and bottom of such shaft for the purpose of attending to signals while the men are being lowered or hoisted out of the mine; they must be at their post of duty at least thirty minutes before the hoisting of coal is commenced in the morning and remain at least thirty minutes after the hoisting of coal has ceased at night. It is also their duty to see that the men do not carry any tools, timber, or material with them on the cage, and that only the proper number of men are allowed upon the cage at one time. A sufficient light must be furnished at the top and botom of the shaft to insure as far as possible the safety of persons getting on or off the cage.

Sec. 3362. A suitable code of signals between the bottom man and the top man and engineer must be established to provide and insure the safety of persons being lowered into and hoisted out of any shaft; said code of signals so established must be conspicuously posted at the top and bottom of the shaft and in the engine room. No person must ride upon a loaded cage or car used for hoisting purposes in any shaft or slope, and in no case must more than twelve persons ride in any cage or car at any one time, nor must any coal be hoisted out of any coal mine, except in cases where coal is being hoisted out of a slope which is not less than ten feet wide and only one track operated therein, while persons are descending into such mine. The number of persons permitted to ascend out of or descend into any coal mine at one time must be determined by the inspector, and they must not be lowered or hoisted more rapidly than five hundred feet per minute.

Th top of each and every shaft and the entrance to each and every intermediate working vein must be securely fencd by gates, properly protecting such shaft and the entrance thereto, and the entrance to every abandoned slope, air or other shaft must be securely fenced off.

Sec. 3363. All underground, self-acting or engine planes, with single track, on which coal cars are drawn and persons travel, must be provided with proper means of signaling between the stopping places and ends of said planes, and sufficient places of refuge at the side of such planes must be provided at intervals of not more than ten wards and all their other single planes or gangways, twenty yards, and they must not be less than six feet wide and whitewashed or otherwise distinguished from the

surrounding walk. The bottom of every shaft must be supplied with a traveling way, to enable men to pass from one side of the shaft to the other without passing under or over the cake. All sumps must be securely planked over, so as to prevent accident.

Sec. 3364. Any person neglecting or refusing to perform the duties required by any of the provisions of this Chapter is punishable as provided in Section 718, of the Penal Code.

Sec. 3365. The inspector of mines is authorized to provide, at the expense of the State, all necessary air meters, barometers or other instruments for the use of himself and deputy in making all investigations and inspections, as required by this Chapter.

CHECK WEIGHMAN.

HOUSE BILL NO. 25.

Session Laws of 1901.

An Act entitled, "An Act providing for the employment of a Check Weighman at Coal Mines, prescribing his duties, and providing penalty for violation thereof."

Be it Enacted by the Legislative Assembly of the State of Montana:

Section 1. The weighman employed at any mine shall subscribe to an oath or affirmation before a justice of the peace, or other officer authorized to administer oaths, to do justice between employer and employee, and to truly and correctly weigh the output of coal from the mines as herein provided. The miners employed by or engaged in working for any mine owner, operator or lessee of any mine in this state shall have the privilege, if they desire of employing at their own expense a check weighman, who shall have like equal rights, powers and privileges in the weighing of coal as the regular weighman, and be subject to the same oath and penalties as the regular weighman. Said oath or affirmation shall be kept conspicuously posted in the weight office, and any weigher of coal or person so employed, who shall knowingly violate any of the provisions of this article, or any owner, operator or agent of any coal mine in this state who shall forbid or hinder miners employing or using a check weighman as herein provided, or who shall prevent or wilfully obstruct any such check weighman in the discharge of his duty, shall be deemed guilty of a misdemeanor, and upon conviction

shall be punished by a fine of not less than One Hundred Dollars nor more than Five Hundred Dollars for each offense, or by imprisonment in the county jail for a period of not less than thirty days nor more than ninety days, or by both such fine and imprisonment, proceedings to be instituted in any court having competent jurisdiction. Whenever the inspector of mines, or deputy inspector of mines shall be satisfied that the provisions of this section have been wilfully violated, it shall be his duty to forthwith inform the prosecuting attorney of any such violation, together with all the facts within his knowledge and the prosecuting attorney shall thereupon investigate the charges so preferred, and if he be satisfied that the provisions of this section have been violated, it shall be his duty to prosecute the person or persons guilty thereof.

Sec. 2. Any person or persons having or using any scale or scales for the purpose of weighing the output of coal at mines, so arranged or constructed that fraudulent weighing may be done thereby, or who shall knowingly resort to or employ any means whatsoever, by reason of which such coal is not correctly weighed and reported in accordance with the provisions of this Article, shall be deemed guilty of a misdemeanor, and shall, upon conviction, for each such offense, be punished by a fine of not less than Two Hundred Dollars nor more than Five Hundred Dollars, or by imprisonment in the county jail for a period not to exceed sixty days, or by both such fine and imprisonment, proceedings to be instituted in any court of competent jurisdiction.

Sec. 3. This Act shall be in full force and effect from and after its passage and approval.

WEIGHT OF COAL.

HOUSE BILL NO. 46.

Session Laws of 1901.

An Act entitled "An Act amending Section 3134, Chapter 6, Part 3, Title 7, of the Political Code of the State of Montana, Relating to Standard Weights and Measures."

Be it Enacted by the Legislative Assembly of the State of Montana:

Section 1. That Section 3134, Chapter 6, Part 3, Title 7, of the Political Code of the State of Montana relating to standard

weights and measures be, and the same is hereby amended to read as follows:

Sec. 3134. The ton consists of twenty hundred pounds, but a ton of mineral coal is expressed by the conventional quantity of twenty-six and one-third bushels of seventy-six pounds each. A bushes of each of the articles hereinafter named consists of the number of pounds affixed to each, to-wit.

	Pounds.
Apples and Pears	45
Beans	60
Bran	20
Carrots	50
Barley	48
Beets	50
Buckwheat	52
Coal, Mineral	76
Corn, in the ear	70
Corn meal	50
Lime, unslacked	80
Oats	32
Parsnips	50
Peas	60
Salt	50
Corn, shelled	56
Hay, per ton	2000
Malt	30
Onions	57
Potatoes	60
Rye	56
Seeds—	Pounds.
Blue Grass	14
Timothy	45
Hemp	44
Turnips	50
Clover	60
Hungarian Grass	50
Flax	56
Wheat	60

Any person, persons, companies or corporations who shall violate the provisions of this section by demanding, exacting

or taking more than the prescribed number of pounds per bushel or per ton as fixed by the provisions of this Section, shall be fiuilty of a misdemeanor and upon conviction thereof, shall be punished by a fine of not less than One Hundred Dollars, nor more than Five Hundred Dollars, or by imprisonment in the county jail not less than three nor more than six months or by both such fine and imprisonment, in the discretion of the court.

Sec. 2. This Act shall take effect from and after its passage and approval by the Governor.

Approved February 18th, 1901.

CHAPTER LIII.

Session Laws of 1903.

An Act entitled "An Act for the Protection of the Health of Engineers and for the Safety of Men Employed Underground, by Regulating the Hours of Labor of Hoisting Engineers and Fixing the Penalties for Violation thereof:

Be it Enacted by the eLgislative Assembly of the State of Montana:

Section 1. That on and after the first day of May, A. D. 1903, it shall be unlawful for any person or persons, company or corporation, to operate or handle, or to induce, persuade or prevail upon any persons or persons to operate or handle, for more than eight hours in twenty-four hours of each day, any hoisting engine at or in any mine. This Act shall apply only to such plants as are in continuous operation or are operated sixteen or more hours in twenty-four hours of each day, or at or in any mine where said hoisting engine develops fifteen or more horse power, or at or in any mine wherein there are fifteen or more men employed underground in twenty-four hours of each day. Provided, however, that the provisions of this Act shall not apply to any person or persons operating any hoisting engine more than eight hours in each twenty-four hours for the purpose of relieving another employee in case of sickness or other unforeseen cause or causes.

Sec. 2. Any person or persons, company or corporation, who shall violate any of the provisions of this Act, shall, upon conviction, be punished by a fine of not less than ten $10.00) dollars, nor more than one hundred ($100.00) dollars; and each and every day that such person or persons, company or corporation

may continue to violate any of the provisions of this Act, shall be considered a separate and distinct offense and shall be punishable as such.

Sec. 3. That all Acts and parts of Acts in conflict with this Act are hereby repealed.

CHAPTER LXXXIII.

Session Laws of 1903.

An act entitled an Act to determine the liability of employers in this State for damages to employees.

Be it Enacted by the Legislative Assembly of the State of Montana:

Section 1. Eevry railway corporation including electric railway corporations, doing business in this State shall be liable for all damages sustained by an employe thereof, within this State without contributing negligence on his part, when such damages are caused by the negligence of any train dispatcher, telegraph operator, superintendent, master mechanic, yardmaster, conductor ,engineer, motorman, or of any other employe who has superintendence of any stationary or hand signal.

Sec. 2. That every company, corporation, or individual operating any mine, smelter or mill for the refining of ores shall be liable for all damages sustained by an employe thereof within this State, without contributing negligence on his part when such damage is caused by the negligence of any superintendent, foreman, shift-boss, hoisting or other engineer, or crane-man.

Sec. 3. All Acts and parts of Acts in conflict herewith are hereby repealed.

Sec. 4. This Act shall take effect and be in force from and after its passage and approval by the Governor.

HOUSE BILL NO. 1.

Session Laws of 1901.

An Act for the Protection of the Health of Men Employed in Underground Mines and in Smelters, Stamp Mills, Sampling Works, Concentrators, or any works where Ores are Mined or Reduced, by Regulating their hours of employment and providing penalties for the violation thereof.

Be it Enacted by the Legislative Assembly of the State of Montana:

Section 1. The period of employment of working men in all underground mines or workings, shall be eight (8) hours per day except in cases of emergency where life or property is in imminent danger.

Sec. 2. The period of employment of working men in smelters, stamp mills, sampling works, concentrators, and all other institutions for the reduction of ores, and refining of ores or metals, shall be eight (8) hours per day, except in cases of emergency where life or property is in imminent danger.

Sec. 3. Any person or persons, body corporate, agent, manager or employer who shall violate any of the provisions of Sections one (1) or Two (2) of this Act shall be deemed guilty of a misdemeanor, and upon conviction thereof shall, for each offense, be subject to a fine of not less than One Hundred Dollars or more than Five Hundred Dollars, or by imprisonment in the county jail for a period of not less than one (1) month, or more than six (6) months or by both such fine and imprisonment.

Sec. 4. All Acts on parts of Acts in conflict with this Act are hereby repealed.

Sec. 5. This Act shall not be in full force and effect until ninety days after its passage and approval by the Governor.

Approved February 2nd, 1901.

SENATE BILL NO. 56.

An Act to prevent all persons Owning or Operating a Coal Mine on the Bank of a Stream containing Fish or Water which is used for Domestic Purposes or for Irrigation from Depositing Coal Slack or Screenings from such mine in such stream, and for Fxing the Penalty for Failure to Comply with the Law.

Be it Enacted by the Legislative Assembly of the State of Montana:

All persons owning or having in operation and all persons who may hereafter own or put in operation in the State of Montana, either in person or by agent, any coal mine on any stream containing fish or water which is used for domestic purposes, or for irrigation, are hereby prohibited from dumping, or causing to be dumped or deposited, any coal slack or screenings emanating from such coal mining operation into the waters of such stream. Provided that this Act shall not be construed to

prohibit persons, companies or corporations from dumping into or returning to said stream the water and refuse from coal washing or cleaning machinery or plants that may be situated on or contiguous to any such stream.

All persons owning or operating or who may hereafter own or operate any coal mine on any stream containing fish or water which is used for domestic purposes, or for irrigation, who shall drop, dump, cart or deposit, or cause or suffer to be deposited in such stream any such coal slack or coal screenings emanating from such coal mining operation, shall be deemed guilty of a misdemeanor, and upon conviction thereof before any court of any competent jurisdiction, shall be fined in any sum not less than two hundred ($200.00) dollars nor more than Five hundred ($500,00) dollars for each and every offense.

Sec. 2. This Act shall be in force and effect on and after November 1st, 1901.

Approved March 9th, 1901.

EXCERPTS

RELATING TO

Coal Mine Inspectors

FROM THE LAWS OF

PENNSYLVANIA, (Anthracite)

OHIO, COLORADO, IOWA, ILLINOIS,

TENNESSEE and

PENNSYLVANIA, (Bituminous.)

Mining Laws of Pennsylvania.

AN ACT

To provide for the health and safety of persons employed in and about the anthracite coal mines of Pennsylvania and for the protection and preservation of property connected therewith.

ARTICLE I.

Section 1. Be it enacted, etc., That this act shall apply to every anthracite coal mine or colliery in the commonwealth, provided the said mine or colliery employs more than ten (10) persons.

ARTICLE II.

Section 3. In order to fill any vacancy that may occur in the office of Inspector of Mines by reason of expiratiton of term, resignation, removal for cause or from any other reason whatever, the judges of the court of Lackawanna county shall appoint an examining board for the counties of Susquehanna, Wayne and Lackawanna, and the judges of the court of Luzerne county shall appoint an examining board for the counties of Sullivan, Carbon and Luzerne, and the judges of Schuylkill county shall appoint an examining board for the counties of Schuylkill, Northumberland, Lebanon, Columbia and Dauphin.

Sec. 4. The said Board of Examiners shall be composed of three reputable coal miners in actual practice and two reputable mining engineers, all of whom shall be appointed at the first term of court in each year, to hold their places during the year. Any vacancies that may occur in the Board of Examiners shall be filled by the court as they occur. The said Board of Examiners shall be permitted to engage the services of a clerk, and they, together with the clerk, shall receive the sum of five dollars per day for every day they are actually engaged in the discharge of their duties under this appointment, and mileage at the rate of six cents per mile from their home to the place of meeting and return by the nearest practicable railway route.

Sec. 5. Whenever candidates for the office of inspector are

to be examined, the said examiners shall give public notice of the fact in not more than five papers published in the inspection district and at least two weeks before the meeting, specifying the time and place where such meeting shall be held. The said examiners shall be sworn to a faithful discharge of their duties, and four of them shall agree in their recommendation of all candidates to the Governor who have answered ninety per centum of the questions; the names of the applicants, the questions asked and answers thereto shall be sent to the Secretary of the Commonwealth, and published in at least two local papers, daily or weekly, and shall recommend only such applicants as they find qualified for the office.

Should the Board of Examiners not be able to agree in their selection and recommendation of a candidate, the judges of the court of common pleas shall dissolve the said board and appoint a new board of like qualifications and powers.

Upon the recommendation of the Board of Examiners as aforesaid, the Governor shall appoint such person or persons to fill the office of inspector of mines under this act, and shall issue to him a commission for the term of five years, subject, however, to removal for neglect of duty or malfeasance in office as hereinafter provided for.

Sec. 6. The person so appointed must be a citizen of Pennsylvania and shall have attained the age of thirty years. He must have a knowledge of the different systems of working coal mines, and he must produce satisfactory evidence to the Board of Examiners of having had at least five (5) years' practical experience in anthracite coal mines of Pennsylvania. He must have had experience in coal mines where noxious and explosive gases are evolved.

Before entering upon the duties of his office he must take an oath or affirmation before an officer properly qualified to administer the same, that he will perform his duties with fidelity and impartiality; which oath or affirmation shall be filed in the office of the prothonotary of the county. He shall also provide himself with the most modern instruments and appliances for carrying out the intentions of this act.

Sec. 7. The salary of each of the said inspectors shall be three thousand dollars per annum, which salary, together with the expense incurred in carrying into effect the provisions of this

act, shall be paid by the State Treasurer out of the treasury of the commonwealth upon the warrant of the Auditor General.

Sec. 8. In case the inspector becomes incapacitated to perform the duties of his office, for a longer period than two weeks, it shall be the duty of the judges of the court of common pleas to deputize some competent person recommended by the Board of Examiners to fill the office of inspector until the said inspector shall be able to fulfill the duties of his office and the person so appointed shall be paid in the same manner as is provided for the Inspector of Mines.

Sec. 9. Each of the said inspectors shall reside in the district for which he is appointed, and shall give his whole time and attention to the duties of the office. He shall examine all the collieries in his district as often as his duties will permit or as often as the exigencies of the case or the condition of the mines require it; see that every necessary precaution is taken to secure the safety of the workmen and that the provisions of this act are observed and obeyed; attend every inquest held by the coroner, or his deputy, upon the bodies of persons killed in or about the collieries in his district; visit the scene of the accident for the purpose of making an examination into the particulars of the same whenever loss of life or serious personal injury occurs as elsewhere herein provided for, and make an annual report of his proceedings to the Secretary of Internal Affairs of the Commonwealth at the close of every year, enumerating every accident in or about the colleries of his district, marking in tabular form those accidents causing death or serious personal injury, the condition of the workings of the said mines with regard to the safety of the workmen therein and the ventilation thereof, and the result of his labors generally shall be fully set forth.

Sec. 10. The Board of Examiners, each for its respective district as hereinbefore provided for, in order to divide more equitably among the several mine inspectors the labor to be performed and the territory to be covered by them in the performance of the duties of the office, may, at any time when they shall deem it desirable or necessary, readjust the several districts by the creation of new boundary lines, thereby adding to or taking from, as the case may be, the districts as at present bounded and described, if the court having jurisdiction approve the same.

And it case it shall be deemed desirable or necessary to read-

just any contiguous district, comprised of more than one judicial district, by the creation of new boundary lines, then in such case the examining boards of the territory affected or requiring such adjustment, shall, in joint session, make such change or readjustment as they shall jointly agreee upon, if the nearest court having jurisdiction in the territory affected to whom the said joint examining boards shall submit the matter, shall approve the same.

ARTICLE II OF THE ACT OF JUNE 2, 1891, AS AMENDED BY THE ACT OF JUNE 8, 1901.

Inspectors and Inspection Districts.

Section 3. In order to fill any vacancy that may occur in the office of Inspector of Mines by reason of the expiration of term, resignation, removal for cause or from any other reason whatever, the judges of the court of Lackawanna county shall appoint an examining board for the county of Lackawanna, and the judges of the court of Luzerne county shall appoint an examining board for the counties of Carbon and Luzerne, and the judges of Schuylkill county shall appoint an examining board for the counties of Schuylkill, Northumberland and Columbia.

Section 4. The said Board of Examiners shall be composed of three reputable coal miners in actual practice and two reputable mining engineers, all of whom shall be appointed at the first term of court in each year, to hold their places during the year. Any vacancies that may occur in the Board of Examiners shall be filled by the court as they occur. The said Board of Examiners shall be permitted to engage the services of a clerk, and they, together with the clerk, shall each receive the sum of five (5) dollars per day for every day they are actually engaged in the discharge of their duties under this appointment, and mileage at the rate of six cents per mile from their home to the place of meeting and return, by the nearest practicable railway route.

Section 5. Whenever candidates for the office of Inspector are to be examined, the said examiners shall give public notice of the fact in not more than five newspapers published in the inspection district, and at least two weeks before the meeting, specifying the time and place where such meeting shall be held. The said examiners shall be sworn to a faithful discharge of

their duties, and at least four of them shall sign a certificate, setting forth the fact of the applicants having passed a successful examination, and who have answered 90 per cent of the questions; the names of the applicants, the questions asked and answers thereto, shall be sent to the Secretary of the Commonwealth, and published in at least two papers, daily or weekly, and shall give such certificate to only such applicant as has passed the required examination.

Section 6. The said Board of Examiners shall hold at least one such examinatiton during each year, at least six months before the date of the general election, in the month of November of each year.

Section 7. At the next general election in November, the qualified voters of the First inspection district shall elect five qualified persons to act as Mine Inspectors of this commonwealth; the qualified voters of the Second inspection district shall elect four qualified persons to act as Mine Inspectors of this commonwealth; the qualified voters of the Third inspection district shall elect one qualified person to act as Mine Inspector of this commonwealth; the qualified voters of the Fourth inspection district shall elect four qualified persons to act as Mine Inspectors of this commonwealth; the qualified voters of the Fifth inspection district shall elect one qualified person to act as Mine Inspector of this commonwealth: Provided, that the present Mine Inspectors in the several inspection districts shall continue in office until the expiration of the terms for which they have been appointed, and the number of inspectors to be elected at the coming election shall be reduced by the number of inspectors now regularly appointed and serving in said districts. When the terms of the present Inspectors shall expire, their successors shall be elected in accordance with the provisions of this act. At the said first election under this act in November, Anno Domini one thousand nine hundred and two, for said Inspectors, the qualified electors of the First inspection district shall elect two Inspectors; the qualified electors of the Second inspection district shall elect two Inspectors; the qualified electors of the Fourth inspection district shall elect two Inspectors; the qualified electors of the Fifth inspection district shall elect one Inspector; and the qualified electors of the Sixth inspection district shall elect one Inspector. At the expiration of the term of office of any of the present Inspectors, who hold

office under the appointment of the Governor of the commonwealth, the qualified electors of the Third inspection district shall elect one Inspector, and as further vacancies are caused by the expiration of the term of office of the present Inspectors, the qualified electors of the several inspection districts shall elect Inspectors to take their places, beginning with the First inspection district, then the Second inspection district, Third inspection district, Fourth inspectiton district, Fifth inspectiton district and Sixth inspection district, until each inspection district has its full quota of elected inspectors under this act. Said Inspectors, elected under this act, shall be under the direction of the Chief of the Bureau of Mines, who shall assign districts to the several Inspectors in the respective counties in which they are elected.

Section 8. Candidates for the office of Mine Inspector shall file with the County Commissioners a certificate from the mine examining board, as above set forth, before their names shall be allowed to go upon the ballot as provided by the County Commissioners for the general election; and the name of no person shall be placed upon the official ballot except such as has filed the certificate as herein required; and no person shall be qualified to act as such Mine Inspector unless such certificate has been previously filed with the County Commissioners of his county.

Section 9. The person so elected must be a citizen of Pennsylvania and shall have attained the age of thirty years. He must have a knowledge of the different systems of work in coal mines, and he must produce satisfactory evidence to the Board of Examiners of having had at least five years' practical experience in anthracite coal mines of Pennsylvania. He must have had experience in coal mines where noxious and explosive gases are evolved.

Before entering upon the duties of his office he shall take an oath or affirmation, before an officer properly qualified to administer the same, that he will perform his duties with fidelity and impartiality; which oath or affirmation shall be filed in the office of the prothonotary of the county. He shall provide himself with the most modern instruments and appliances for the carrying out of the intentions of this act.

Section 10. The salary of each of the said Inspectors shall be three thousand dollars per annum, which salary, together

with the expenses incurred in carrying into effect the provisions of this act, shall be paid by the State Treasurer out of the treasury of the commonwealth upon the warrant of the Auditor General.

Section 11. Each of the said Inspectors shall hold said office for a term of three years from the first Monday of January immediately succeeding his election to said office, and until his successor is duly elected and qualified.

Section 1p. It shall be the duty of the Chief of the Bureau of Mines and Mining to direct one or more of the Inspectors who shall be elected under this act, and it shall be the duty of said Inspectors to obey said orders of the said Chief of Bureau of Mines and Mining, to inspect such collieries as come under the act to which this act is an amendment in counties not mentioned in this amendment to said act, in such manner and at such times as is required by law, and the Inspectors inspecting said collieries shall make and include in their returns a due report of said inspection.

Section 13. In case of death, resignation, removal from office or other vacancies in the office of Mine Inspector before the expiration of said term of office, the judges of the court of common pleas of the county in which said vacancy occurs shall appoint a duly qualified person to fill said vacancy for the unexpired term. Said appointee to be one of the persons having filed with the County Commissioners of said county a certificate from the Board of Examiners, showing he passed a successful examination before the said board, and is duly qualified as hereinbefore mentioned.

Section 14. In case the Inspector becomes incapacitated to perform the duties of his office for a longer period than two weeks, it shall be the duty of the judges of the court of common pleas of the county from which said Inspector was elected to deputize some competent person, recommended by the Board of Examiners, to fill the office of Inspector until the said Inspector shall be able to fulfil the duties of his office, and the person so appointed shall be paid in the same manner as is provided for the Inspector of Mines.

Section 15. Each of the said Inspectors shall reside in the district for which he is elected, and shall give his whole time and attention to the duties of his office. He shall examine all the collieries in his district at least once every two months, as

often in addition thereto as the necessities of the case or the condition of the mines require. He shall see that every necessary precaution is taken to secure the safety of the workmen and that the provisions of this act are observed and obeyed; and he shall personally visit each working face, and see that the air-current is carried to the working faces and is of sufficient quantity or volume to thoroughly ventilate the places. He shall every three months make a report of the condition of each working face in each colliery, on a form to be furnished to the Inspectors by the Chief of the Bureau of Mines and Mining, designating the gangway in which the working is situated, and the breast number of said working and their conditon shall be designated by the words good, fair or bad, as the circumstances may warrant; and the said report, or a duplicate, shall be placed in a weather or dust-proof case, with a glass front; said case to be furnished by the operator and placed in a conspicuous place at each mine opening, shaft, slope or drift, so that the workmen may have easy access thereto. He shall certify in said report that the employes are hoisted to the surface of the ground or given access thereto according to law; he shall attend every inquest held by the coroner or his deputy upon the bodies of persons killed in or about the collieries in his district; he shall visit the scene of the accident, for the purpose of making an examination into the particulars of the same, wherever loss of life or serious personal injury occurs, as elsewhere herein provided for, and make an annual report of his proceedings to the Secretary of Internal Affairs of the Commonwealth at the close of every year, enumerating all the accidents in and about the collieries in his district, marking in tabular form those accidents causing death or serious personal injury; the condition of the workings of the said mines with regard to the safety of the workmen therein and the ventilation thereof, and the results generally shall be fully set forth; and such other duties as now are or hereafter may be required by law.

Section 16. The nomination and election of said Mine Inspectors shall be under the general election laws of this commonwealth.

Section 17. The Mine Inspector shall have the right, and it is hereby made his duty, to enter, inspect and examine any mine or colliery in the territory allotted to him and the workings and machinery belonging thereto, at all reasonable times, either by

day or by night, but not so as to obstruct or impede the working of the colliery, and shall have power to take one or more of his fellow inspectors into or around any mine or colliery in the territory allotted to him, for the purpose of consultation or examination.

He shall also have the right, and it is hereby made his duty to inquire into the condition of such mine or colliery workings, machinery, ventilation, drainage, method of lighting or using lights, and into all matters and things connected with or relating to as well as to make suggestions providing for the health and safety of persons employed in and about the same, and especially to make inquiry whether the provisions of this act have been complied with.

The owner, operator or superintendent of such mine or colliery is hereby required to furnish the means necessary for such entry, inspection, examination, inquiry and exit.

The Inspector shall make a record of the visit, noting the time and material circumstances of the inspection.

Section 18. No person who shall act or practice as a land agent or as a manager or agent of any coal mine or colliery, who is pecuniarily interested in operating any coal mine or colliery, shall at the same time hold the office of Inspector of Mines under this act.

Section 19. Whenever a petition signed by fifty or more reputable coal miners, or more, or both, setting forth that any Inspector of Mines neglects his duty, or is incompetent, or is guilty of malfeasance in office, it shall be the duty of the court of common pleas from which said Inspector was elected to issue a citation, in the name of the commonwealth, to the Inspector to appear at not less than five days' notice, on a day fixed, before said court, and the court shall then proceed to inquire into and investigate the allegations of the petitioners. If the court finds that the said Inspector is neglectful of his duties, or is incompetent to perform the duties of his office for any cause that existed previous to his election, or that has arisen since his election, or that he is guilty of malfeasance in office, the court shall declare the said Inspector removed from office and proceed to fill the vacancy. The cost of said investigation shall be borne by said Inspector; but if the allegations in the petition are not sustained, the cost shall be paid by the Treasurer of this commonwealth upon warrant of the Auditor General, or by the pe-

titioners, in case the court finds that there was no probable ground for said charge.

Section 20. The maps and plans as the mines and the records thereof, together with all the papers relating thereto, shall be kept by the Inspector, properly arranged and preserved, in a convenient place in the territory to which the Inspector has been allotted, and shall be transferred by him, with any other property of the commonwealth that may be in his possession, to his successor in office.

Section 21. This act shall go into effect from the first day of January, Anno Domini one thousand nine hundred and two.

Section 22. All acts or parts of acts inconsistent with the provisions of this act are hereby repealed.

Approved—The 8th day of June, A. D. 1901.

WILLIAM A. STONE.

EXTRACT FROM REPORT OF DEPARTMENT OF MINES FOR 1903.

HON. JAMES E. RODERICK, Chief of Department.

ELECTION OF INSPECTORS.

Remarks on Article II of the Act of June 8, 1901.

The first general anthracite mine law of Pennsylvania was enacted by the Legislature in 1870. In 1885 it was revised in accordance with the recommendations of a Commission consisting of six miners, three operators and six inspectors, appointed by the Governor. It was further revised in 1891 on the recommendation of a Commission of eight miners, three operators, two mining engineers and two inspectors, appointed by the Governor, and in 1901 article II of the act of 1891 was further amended. The act of 1885 was much more satisfactory than the act of 1870 or the act of 1891 or the amendment of 1901, as its provisions were fair to the miners, operators and inspectors.

During the years 1889 and 1890 considerable dissatisfaction was manifested regarding the inspectors, especially in Schuylkill county, and this feeling was intensified against one of them who, from mistaken judgment, committed an act that, while not a violatiton of the law, was repugnant to the miners. It was an act entirely outside of his duties as inspector. Had any com-

plaint been made to this Department regarding this inspector, or any of the other inspectors, it would have received immediate attention and the matter would have been thoroughly investigated. I did, on account of the persistent rumors regarding some of the inspectors, make a careful inquiry to ascertain the causes of complaint, but found nothing to indicate that any of them had neglected their duties. This antagonistic feeeling against the inspectors was encouraged and kept alive to such an extent by a few interested persons, that the miners finally assembled in convention and passed resolutions calling upon the legislature to amend the mining law so that the anthracite inspectors could be elected by the people. They believed that this would do away with all objectionable inspectors and remove all causes of complaint, and that it would also open an avenue for ambitious miners to become inspectors. **The fact is, however, that the office of inspector has always been open to all miners qualified to fill it; but in all the years from 1870 to 1903 only one miner has passed a successful examination before the examining board in the anthracite region.** (The word "miner" employed here means a man actually employed at cutting coal.) The reason for this is found in the fact that the operators have always advanced the most intelligent miners to be foremen and fire bosses, and many of them have become superintendents and general managers of large corporatitons. One of them has recently attained the presidency of one of the most prominent coal companies. It is from this class of miners who are foremen and superintendents, that the anthracite inspectors have generally been selected, after a rigid competitive examination before a board composed of three miners and two mining engineers. With but one or two exceptions, the anthracite inspectors from 1870 to 1900 have been men of good moral character and practically and theoretically proficient. All the anthracite laws have favored the miners in the formation of examining boards, and they have always had three-fifths of the membership of each board. They have therefore been able to control the actions of the boards, and if at any time a man was chosen for the office of inspector who was not thoroughly qualified, the responsibility can be placed upon the miners.

In compliance with the demands of the miners, the Legislature in 1901 amended Article II of the law of 1891, providing.

that after a certain date, all inspectors should be elected by the people under the general election law of the state, after first having passed an examinatiton and answered 90 per centum of the question propounded. The election of mine inspectors by the people is unheard of in any other state in the Union, except Kansas, and in any other country in the world, so far as I know. It is a most pernicious practice, as it brings the applicant for an office created for the preservation of life and property, into the vortex of political intrigue, and I sincerely hope the time will soon come when both the miners and operators will demand the repeal of this law. If, however, the election of inspectors is to continue, they should, at least, be elected by the miners and the operators, who are the people directly interested in the office. More than this, the miners and operators of each district should vote for their own inspector. For instance, the Fifth and Ninth districts of Luzerne county are about 60 miles apart, and the residents and miners are nearly all strangers to one another. Why should the voters of the Ninth district vote for the inspector of the Fifth, when the majority of the miners in the former district are ignorant of the qualifications necessary in the inspector of the Fifth? The reasons are equally good why the voters of the Fifth district should not vote for the inspector of the Ninth. It may be presumed that the inspector of the Ninth district has satisfied the miners and operators of his district, and if so, why should the voters of the Fifth district have a right to vote against him and possibly elect his opponent, regardless of the wishes of the people of his district.

If the election of inspectors can in any way be justified, it still remains a fact that the present method is unfair to all persons whose interests are concerned. Although Article II was amended in 1901, through a defect or an omission in its provisions only one election of inspectors has been held up to the present time. That election, however, indicated clearly how future election would be conducted. The candidates for election in 1902 traversed the counties and used the same methods to obtain votes that were used by the other aspirants to political office. In large counties like Luzerne, Lackawanna and Schuylkill, they spent the best part of two months canvassing for the election, and if they had held the office at the time, it is unnecessary to say that the work of inspection would have been ut-

terly neglected during that period. Can the state afford to pay wages to inspectors while they are electioneering, and consequently neglecting their duties? How will the miners regard it? The method is unquestionably opposed to the best interests of the state, the miners and the operators. The voters of the cities of Scranton, Wilkesbarre and Pottsville, if they choose to do so, can decide who the inspectors shall be in Lackawanna, Luzerne and Schuylkill counties, while possibly not more than 20 per centum of them are mine workers. Again, why should the large farming districts of these counties have a vote as to who shall inspect the mines? The voters in both of these instances are without interest in the matter. Why should the court of Schuylkill county be empowered to appoint a board to examine applicants for mine inspector in Northumberland, Columbia and Dauphin counties (Article II, Section 3) when, if a vacancy occurs in Northumberland couuty, it can be filled only by the court of that county (Article II, Section 13)?

Great dissatisfaction necessarily exists with this law, particulparly among the inspectors, and seven of the most competent ones (the equals of any in the world) have resigned from their positions since 1902. Under the old law, only two resigned from 1870 to 1902, and they did so to accept very lucrative positions.

The evil effects of the election of inspectors may reach even to the selection of mine foremen and fire bosses. The inspector is an exofficio member of the examining board, and there is reason to fear that in many cases a poorly qualified candidate who possesses some political influence may be treated with leniency not only discreditable to the board, but inimical to the interests of the miners and operators. Upon the vigilance, care and efficiency of these officers depends largely the welfare of the mining interests, and I note with regret that during the past year certificates of qualification have been granted to men regarding whose incompetency there can be but little doubt. I hope the miners and operators will seriously consider my remarks upon this question, and make a joint effort to have the next Legislature repeal the amendment to Article II.

The system formerly in vogue in Pennsylvania in selecting inspectors by a competitive examination, was the best ever devised. In other states and in foreign countries, the appointments are made by the Governors or others in authority, with-

out any test of qualifications. In some states the office of inspector is considered a political one and a change in the party administration generally causes a change in the inspectors. Any other system, however, is preferable to our present one, which we deem the worst extant, and if we are not to return to the old one, let us do as the other states do, and give the Governor power of appointment, even if it be without the requirement of qualification. In this connection I desire to say that the bituminous law of this state, in this respect, is entirely satisfactory. It provides that competitive examinations be held every four years by a board of five persons, appointed by the Governor, three of whom shall be miners. The board reports to the Governor the applicants who have answered 90 per centum of the questions, and he commissions as many inspectors as may be needed, from those who have received the highest percentage. If the number of successful candidates is greater than the number of existing vacancies, the names are placed on a reserve list, and when vacancies occur the Governor appoints the applicants having the highest percentage. This method could be adopted for the anthracite region.

Another injustice resulting from the amendment to Article II is the unequal distribution of the work of the inspectors, some of them having three times as much to do as others. For instance, the unfairness of including 29 collieries in the district of the inspector of Northumberland county, and only seven collieries in the district of the inspector of Carbon county will be apparent to everybody. The former district in 1903 employed 14,580 persons in and about the mines, and produced 4.927,304 tons of coal; the latter district employed 4,051 persons, and produced 1, 919, 662 tons. Columbia county was also made a separate district by this amendment, althought it has fewer mines even than Carbon county. The Columbia district Dauphin county has been added, but the combined area is hardly one-third as large as the Northumberland district. Under the law, the Chief of the Department of Mines has no authority to send the inspector of Columbia county to inspect the mines of Dauphin county. The inspector of Columbia county is aware of this fact, but he does the work as a matter of courtesy. He would be within his rights if he refused to do it, as the law prohibits his acting in any other county than the one in which he

was elected. The operators of Dauphin county might also be within their rights if they refused to have him inspect their mines.

I have endeavored to show some of the defects of the amendment in question, and in order that they might be remedied as quickly as possible, I respectfully suggest that the next session of the Legislature repeal it, and empower the Chief of the Department of Mines to make an equitable division of the work among the inspectors, without regard to county lines. I also suggest that the Legislature empower the Governor to appoint a commission to revise the mining laws of the state. From the present statutes, complex and intricate as they are, a law could be framed that might meet all the requirements of the anthracite and bituminous regions. The opinion used to prevail that the law governing the bituminous mining operations need not be as stringent as those governing the anthracite region. Very few bituminous mines were thought dangerous, even as late as 1893. As a matter of fact, however, there is much more danger of serious catastrophies in the bituminous mines than in the anthracite. There are bituminous mines to-day in which the carelessness of one man might result in the destructiton of hundreds of lives. My observation leads me to think that one good law, stringent but just, would best meet the interests of all concerned. The commission might be composed of two miners, one operator and one mining engineer from the anthracite region, with one person to represent the Governor, and who shall act as chairman of the commission. The latter member should have practical and theoretical knowledge of the workings and ventilatiton of coal mines, but should have no financial interest in mining. The commission should have power to engage an expert constitutional lawyer to decide all questions of constitutionality, and an expert stenographer to make a complete record of the proceedings of the commission to the Legislature in 1907. The Legislature should then, without unnecessary delay, enact the law as recommended by the commission, and all amendments offered should be voted down, as the Legislature is not competent to amend mine laws, as not 10 per cent of the members are familiar with the needs of the mining industry.

MINING LAWS OF OHIO.

INSPECTOR OF MINES.

Section 290. For the purpose of facilitating an efficient and thorough inspection of mines in Ohio, and to provide an adequate inspecting force therefor, the Governor shall appoint, by and with the consent of the Senate, one chief inspector, who, with the approval of the Governor, shall appoint five district inspectors of mines; the chief inspector shall hold his office for the term of four years, and the district inspectors shall hold their office for the term of three years from the date of their appointment, and until their successors are appointed and qualified; the first appointments hereunder shall be made within thirty days from the date when this act shall take effect; and in case of the resignation, removal or death of the chief inspector, or any district inspector, the vacancy shall be filled in the manner above provided for original appointments for the unexpired term only of the position so made vacant. No person shall be appointed chief inspector of mines unless he is possessed of a competent knowledge of chemistry, the geology of Ohio, and mineralogy, in so far as these sciences relate to mining, and has a practical knowledge of mining engineering and the different systems of working and ventilating mines, and the nature and properties of the noxious and poisonous gases of mines, particularly fire damp, and of the best means of preventing and removing the same; and no person shall be appointed district inspector of mines unless he be a practical miner of at least five years' experience, and a resident of the district for which he is appointed for at least two years, and is possed of a practical knowledge of the best mode of working and ventilating mines, of the means of detecting the presence of bad or foul air, noxious and poisonous gases, and of the best means of preventing and removing the same.

Sec. 290a. That authority be and is hereby given to appoint two additional district inspectors of mines; and they shall be appointed in the same manner and possess the same qualificatitons and receive the same compensation as the five district inspectors of mines authorized by said section 290. The term of office of the two district inspectors of mines herein provided for shall be three years, and they shall take an oath and give bond, as pro-

vided in Sec. 291 of the Revised Statutes of Ohio, and shall be subject to the regulations and requirements of the district inspectors authorized in said Sec. 290, as provided in chapter nine of the Revised Statutes of Ohio. The chief inspector of mines shall assign said additional inspectors for service in districts to be designated by him, and he is authorized to divide the state in seven districts, in each of whic hone of the district inspectors of mines shall reside.

MINING LAWS OF COLORADO.

Section 14. That the board of examiners heretofore appointed under the provisions of this act concerning coal mines, approved February 24, 1883, and amended by this act, shall hold their office for and during the time for which they were appointed, to-wit: until January 1, A. D. 1887. And it shall be the duty of the board of examiners to meet at such time and such places within the state as may be directed by the governor of this state, and examine such persons as may present themselves for examination, touching their qualifications for the office of mine inspector, as provided in this act, and shall inquire into their character and qualificatitons, and shall certify the names of such persons as they shall find to be competent to fill such office of mine inspector, to the Governor, which list of names, so certified, shall be placed on file in the office of the secretary of state. Members of such board of examiners shall, before entering upon their duties, take and subscribe the following oath, viz: We, the undersigned, do solemnly swear (or affirm), that we will perform the duties of examiners of applicants for appointment of inspector of coal mines, to the best of our abilities, and that in recommending or rejecting said applicants, we will be governed by the evidence of qualifications to fill the position under the law creating the same, and not by any consideration of political or personal favors; that we will certify to all whom we may find qualified, according to the true intent and meaning of the act, and none others, to the best of our judgment. The qualifications of candidates for said office of inspector of mines, to be inquired into and certified by said examiners, shall be as follows, namely: They shall be citizens of the United States, of temperate habits, of good repute as men of personal integrity,

shall have obtained the age of thirty years, and shall have had at least one year's experience in the working of coal mines of Colorado, and five years of practical experience in the working of coal mines in the United States, and have a practical knowledge of mining engineering, and of the different systems of working and ventilating coal mines, and of the nature and properties of the noxious and poisonous gases of mines, particularly fire-damp. The board of examiners shall receive six dollars per day, and same mileage as is allowed to members of the Legislature, to be paid out of the state treasury, upon the filing of the certificates of the examining board in the office of the Secretary of State, as hereinbefore provided. As often as vacancies in said office of inspector of mines shall occur, by death, resignation or malfeasance in office, which shall be determined in the same manner as in the case of any other officer of the state government, the Governor shall fill the same, by appointment, for the unexpired term, from the names on file in the office of the Secretary of State, as hereinbefore mentiond, as having passed examination. On January 1, A. D. 1887, and every four years thereafter, the Governor shall appoint one reputable mining engineer, of known ability, and shall notify the judges of four of the judicial districts of the state, within which coal mines are being operated, to each appoint one reputable coal miner, of known experience and practice, from their respective districts, and the five so appointed shall constitute a new board of examiners, whose duties, term of service and compensation shall be the same as those provided for by this section; and from the names that may be certified by them, the Governor shall appoint the inspector of mines provided for in this act. Nothing in this act shall be construed to prevent the reappointment of any inspector of coal mines. The inspector of coal mines shall receive for his services an annual salary of two thousand dollars, and ten cents per mile mileage for all distances traveled in the discharge of his official duties, to be paid monthly by the state treasurer; and said inspector shall reside in the state, and shall keep an office at the capitol, or other building, in which the offices of the state are located. Each inspector is hereby authorized to procure such instruments and chemical tests, and stationery, from time to time, as may be necessary to the proper discharge of his duties under this act, at the expense of the state, which shall be

paid by the state treasurer, upon accounts duly certified by him and audited by the proper department of the state. All instruments, plans, books, memoranda, notes, etc., pertaining to the office, shall be the property of the state, and shall be delivered to their successors in office.

MINING LAWS OF IOWA.

Section 2478. Inspectors. The Governor shall appoint three mine inspectors from those receiving certificates of competency from the board of examiners hereinafter provided for, who shall hold their office for two years and until their successor shall be appointed and qualified, subject to removal by him for cause, their term to commence the first Monday of April of each even-numbered year. Any vacancies occurring shall be filled in the same manner, the appointee to hold for the unexpired term only. Each inspector shall be in no way connected with or interested in mines or mining in the state, and shall, before entering upon the discharge of his duties, take an oath, to be endorsed upon his bond, faithfully and impartially to perform the same, and also give a bond in the sum of two thousand dollars with sureties, to be approved by the Secretary of State, conditioned in accordance with the tenor of the oath, which shall be filed and, with the oath and commission, recorded in the office of the Secretary of State.

Sec. 2479. Board of Examiners. The executive council shall appoint a board of five examiners, consisting of two practical miners and two mine operators, all holding certificates of competency as mine foremen, and one mining engineer, each of whom shall have had at least five years' actual experience in his profession immediately preceding his appointment, who shall hold office for a term of two years. The members of said board shall qualify by taking oath to perform the duties devolving upon them fairly, faithfully and impartially, without fear or favor, uninfluenced by personal or political considerations. No member of said board shall be interested in or connected with any school, scheme, plan or device having for its object the preparation, education or instruction of persons in the knowledge required of applicants for certificates of competency. Any member of said board shall be summarily removed from office by the

executive council, upon due notice and hearing, for violation of the law, misfeasance or malfeasance in the performance of his duties, or for other sufficient cause, and his successor shall thereupon be appointed by the said executive council for the unexpired term.

Sec. 2480. Meetings—Compensation. Said board shall meet in the office of the State Mine Inspectors at the capitol on the first Monday in March of each even-numbered year for the examination of applicants; notice of which examination shall be published in at least one newspaper in each mining district not less than fifteen days preceding the date of such examination; and shall be furnished with the necessary stationery and other material for the examination in the same manner as other state officers are provided with supplies. The members shall receive as compensation for their services the sum of five dollars per day for the time actually employed, with necessary traveling expenses, which shall be audited and paid in the manner provided for the salaries of other state officers, but in no case shall the per diem exceed fifty dollars a session to each member.

Sec. 2481. Examination—qualification of candidates. The examination shall consist of oral and written questions in theoretical and practical mining and mine engineering, on the nature and properties of noxious and poisonous gases found in mines, During the progress of the examinatiton, books, memoranda or notes shall not be allowed or used, and the board shall issue to those examined and found to possess the requisite qualifications certificates of competency for the position of mine inspector; but certificates shall be granted only to persons of twenty-five years of age or over, of good moral character, citizens of the state, and with at least five years' experience in the practical working of mines, and who have not been acting as agent or superintendent of any mines for at least six months preceding such examinatiton.

MINING LAWS OF ILLINOIS.

In force July 1, 1903.

Sec. 6. Manner and Purpose of Appointment. For the purpose of securing efficiency in mine inspection service, and a high standard of qualification in those who have the manage-

ment and operation of coal mines, the State Commissioners of Labor shall appoint a board of examiners, to be known as the State Mining Board, whose duty it shall be to make formal inquiry into and pass upon the practical and technical qualifications and personal fitness of men seeking appointments at state inspectors of mines, and those seeking certificates of competency as mine managers, hoisting engineers and as mine examiners.

Composition of Board (a)—This board shall be composed of five members, two of whom shall be practical coal miners, one a practical hoisting engineer, and two coal operators, one of whom shall be an expert mining engineer. Amended and in force July 1, 1903.

Date and Term of Appointment (b)—Their appointment shall date from July 1, 1899, and they shall serve for a term of two years, or until their successors are appointed and qualified; they shall organize by the election of one of their number as president and some suitable person, not a member, as secretary, after which they shall all be sworn to a faithful performance of their duties.

Rooms for Meeting and Supplies Furnished by Secretary of State (c)—The Secretary of State shall assign to the use of the board suitably furnished rooms in the State House for such meetings as are held at the Capitol, and shall also furnish whatever blanks, blank books, printing and stationery the board may require in the discharge of its duties.

Regular and Special Meetings (d)—The board shall meet at the Capitol in regular session on the second Tuesday in September of the year 1899, and biennially thereafter, for the examination of candidates for appointment as state inspectors of mines; for the examinatiton of persons seeking certificates of competency as mine managers, hoisting engineers and mine examiners. The board shall meetings at such times and places within the state as shall, in the judgment of the members, afford the best facilities to the greatest number of probable candidates. Special meetings may also be called by the Commissioner of Labor whenever, for any reason, it may become necessary to appoint one or more inspectors. Public notice shall be given through the press or otherwise, announcing the time and place at which examinations are to be held.

Rules of Procedure (e)—The examinations herein provided for shall be conducted under such rules, conditions and regulations as the members of the board shall deem most efficient for carrying into effect the spirit and intent of this act. Such rules, when formulated, shall be made a part of the permanent record of the board and such of them as relate to candidates shall be published for their informatiton and goverance prior to each examination; they shall also be of uniform application to all candidates.

Approved May 14, in force July 1, 1903.

Sec. 7. For Inspectors (a)—Persons coming before the State Mining Board as candidates for appointment as State Inspectors of Mines must produce evidence satisfactory to the board that they are citizens of this state, at least thirty years of age, and that they are men of good repute and temperate habits; they must also submit to and satisfactorily pass an examination as to their practical and technical knowledge of mining engineering and mining machinery and appliances, of the proper development and operation of coal mines, of ventilation in mines, of the nature and properties of mine gases, of the geology of the coal measures in this state and of the laws of this state relating to coal mines.

Names Certified to the Governor (b)—At the close of each examination for inspectors the board shall certify to the Governor the names of all candidates who have received a rating above the minimum fixed by the rules of the board as properly qualified for the duties of inspectors.

Inspectors Appointed (c)—From those so named the Governor shall select and appoint seven state inspectors of mines; that is to say, one inspector for each of the seven inspection districts provided for in this act, or more, if, in the future, additional inspection districts shall be created, and their commissions shall be for a term of two years from October first: Provided, that any one who has satisfactorily passed two of the state examinations for inspectors, and who has served acceptably as state inspector for two full terms, upon making written application to the board setting forth the facts, shall also be certified to the Governor as a person properly qualified for appointment. But no man shall be eligible for appointment as a State Inspector of Mines who has any pecuniary interest in any coal mine, either as owner or employe.

MINING LAWS OF TENNESSEE.

Senate Bill No. 222.

A bill to be entitled an Act to provide for the regulatiton and inspection of mines in the state, and for the safety, welfare and protection of persons employed therein, and providing for penalties for violations of this Act.

Section 1. Be it enacted by the General Assembly of the State of Tennessee, For the purpose of greater security and protection to the life and health of persons employed in and around the mines, and to increase the security and protection connected with the mining operations, and to facilitate an efficient and thorough inspection of the mines in Tennessee, and to provide an adequate inspecting force therefore, the Governor shall appoint one (1) chief mine inspector, who, with the approval of the Governor, shall appoint two district mine inspectors. The chief mine inspector shall hold his office for the term of four (4) years, or until his successor is appointed and qualified. The first appointment hereunder shall be made within thirty (30) days from the date when this act shall take effect; and in case of resignation, removal or death of the chief inspector, or any district inspector, such vacancy shall be filled in the manner above provided for original appointments for the unexpired term, so made vacant. No person shall be appointed chief mine inspector unless he is possessed of a competent knowledge of chemistry, geology and mineralogy of Tennessee, smo far as these sciences relate to mining, and has a practical knowledge of mining engineering and the different systems of working and ventilating mines, and the nature and properties of the noxious, poisonous and explosive gases found in mines, and the best means of preventing dangers and the removal of the same, and shall have had six (6) years' experience in mining, and shall have been a citizen and a resident of Tennessee for two (2) years, and shall be of good moral character and temperate habits; and he shall not, while in office, be interested as owner, agent, operator, stockholder, superintendent or engineer of any mine, and may be removed for cause by the Governor at any time. No person shall be appointed district inspector of mines unless he is a practical miner of at least six (6) years' experience in mining, has been a citizen and resident of Tennessee for two (2) years or more, and is

possessed of a practical knowledge of the best mode of working and ventilating mines, and of the best means of detecting noxious, poisonous and explosive gases and of the best means of preventing and removing same, and shall not while in office be interested as owner, agent, stockholder, superintendent, foreman or otherwise interested in any mine; and he shall be of good moral character and temperate habits and possessed of a Class "A" foreman's certificate of competency as required for foremen of mines in this state.

BITUMINOUS MINING LAWS OF PENNSYLVANIA, 1903

ARTICLE X.

Inspectors, Examining Boards, Etc.

Section 1. The board of examiners appointed to examine candidates for the office of mine inspector under the provisions of the act to which this is a supplement, shall exercise all the powers granted, and perform all the duties required by this supplementary act, and at the expiration of their term of office, and every four years thereafter, the Governor shall appoint, as hereinafter provided, during the month of January, two mining engineers of good repute and three other persons, who shall have passed successful examinations qualifying them to act as mine inspectors or mine foremen in mines generating fire-damp, who shall be citizens of this Commonwealth and shall have attained the age of thirty years and shall have had at least five years' practical experience in the bituminous mines of Pennsylvania, and who shall not be serving at tht time in any official capacity at mines, which five persons shall constitute a board of examiners whose duty shall be to inquire into the character and qualification of candidates for the office of inspector of mines under the provisions of this act.

Section 2. The examining board so constituted shall meet on the first Tuesday of March following their appointment, in the city of Pittsburg, to examine applicants for the office of mine inspector: Provided, however, The examining board shall meet two weeks previous to the aforesaid time for the purpose of preparing questions, etc., and when called together by the Governor on extra occasions at such time and place as he may des-

ignate, and after being duly organized and having taken and subscribed before any officer authorized to administer the same, the following oath, namely, "We, the undersigned, do solemnly swear (or affirm) that we will perform the duties of examiners of applicants for the appointment as inspectors of bituminous coal mines to the best of our abilities, and that in recommending or rejecting said applicants, we will be governed by the evidence of the qualifications to fill the position under the law creating the same, and not by any consideration of political or personal favor; and that we will certify all whom we may find qualified according to the true intent and meaning of the act and none others."

Section 3. The general examination shall be in writing and the manuscript and other papers of all applicants, together with the tally sheets and the solution of each question as given by the examining board, shall be filed with the Secretary of Internal Affairs as public documents, but each applicant shall undergo an oral examination pertaining to explosive gases and safety lamps, and the examining board shall certify to the Governor the names of all such applicants which they shall find competent to fill the office under the provisions of this act, which names, with the certificates and their percentages and the oaths of the examiners, shall be mailed to the Secretary of the Commonwealth and be filed in in his office. No person shall be certified as competent whose percentage shall be less than ninety per centum, and such certificate shall be valid only when signed by four of the members of the examining board.

Section 4. The qualifications of candidates for said office of inspector of mines to be inquired into and certified by said examiners, shall be as follows, namely: They shall be citizens of Pennsylvania, of temperate habits, of good repute as men of personal integrity, and shall have attained the age of thirty years, and shall have had at least five years of practical experience in working of or in the workings of the bituminous mines of Pennsylvania immediately preceding their examination, and shall have had practical experience with fire-damp inside the mines of this country, and upon examination shall give evidence of such theoretical as well as practical knowledge and general intelligence respecting mines and mining and the working and ventilation thereof, and all noxious mine gases, and will satisfy

the examiners of their capability and fitness for the duties imposed upon inspectors of mines by the provisions of this act. And the examining board shall immediately after the examination, furnish to each person who came before it to be examined, a copy of all questions whether oral or written which were given at the examination on printed slips of paper, and to be marked solved, right, imperfect or wrong, as the case may be, together with a certificate of competency to each candidate who shall have made at least ninety per centum.

Section 5. The board of examiners may, also at their meeting, or when at any time called by the Governor together for an extra meeting, divide the bituminous coal region of the state into inspection districts, no district to contain less than sixty nor more than eighty mines, and as nearly as possible equalizing the labor to be performed by each inspector, and at any subsequent calling of the board of examiners this division may be revised as experience may prove to be advisable.

Section 6. The board of examiners shall each receive ten dollars per day for each day actually employed, and all necessary expenses, to be paid out of the state treasury. Upon the filing of the certificate of the examining board in the office of the Secretary of the Commonwealth, the Governor shall, from the names so certified, commission one person to be inspector of mines for each district as fixed by the examiners in pursuance of this supplementary act, whose commission shall be for a full term of four years from the fifteenth day of May following: Always provided, however, The highest candidate or candidate in percentage shall have priority to be commissioned for a full term before those candidates of lower percentage, and in case of a tie in percentage, the oldest candidate shall be commissioned.

Section 7. As often as vacancies shall occur in said office of inspector of mines, the Governor shall commission for the unexpired term from the names on file, the highest in percentage in the office of the Secretary of the Commonwealth, until the number shall be exhausted, and whenever this may occur, the Governor shall cause the aforesaid board of examiners to meet, and they shall examine persons who may present themselves for the vacant office of mine inspector as herein provided, and the board of examiners shall certify to the Governor all persons who shall have made ninety per centum in said examination, one

of whom to be commissioned by him according to the provisions of this act for the office of mine inspector for the unexpired term, and any vacancy that may occur in the examining board shall be filled by the Governor of this Commonwealth.

Section 8. Each inspector of mines shall receive for his services an annual salary of three thousand dollars and actual traveling expenses, to be paid quarterly by the State Treasurer upon warrant of the Auditor General, and each mine inspector shall keep an office in the district in which he is commissioned and he shall be permitted to keep said office at his place of residence: Provided, A suitable apartment or room be set off for that purpose. Each mine inspector is hereby authorized to procure such instruments, chemical tests and stationery and to incur such expenses of communication from time to time, as may be necessary to the proper discharge of his duties under this act, at the cost of the state, which shall be paid by the State Treasurer upon accounts duly certified by him and audited by the proper department of state.

Section 9. All instruments, plans, books, memoranda, notes and other material pertaining to the office shall be the property of the state, and shall be delivered to their successors in office. In addition to the expenses allowed by law to the mine inspectors in enforcing the several provisions of this act, they shall be allowed all necessary expenses by them incurred in enforcing the several provisions of said law in the respective counties of the commonwealth, the same to be paid by the State Treasurer on warrants drawn by the Auditor General after auditing the same; all such accounts presented by the mine inspector to the Auditor General shall be itemized and first approved by the court before which the proceedings were instituted.

Sectiton 10. Each mine inspector of bituminous coal mines shall ,before entering upon the discharge of his duties, give bond in the sum of five thousand dollars, with sureties to be approved by the presiding judge of the district in which he resides, conditional for the faithful discharge of his duties, and take an oath or affirmation to discharge his duties impartially and with fidelity to the best of his knowledge and ability. But no person who shall act as manager or agent of any coal mine, or as mining engineer or is interested in operating any coal mine, shall, at the same time act as mine inspector of coal mines under this act.

Section 11. Each inspector of bituminous coal mines shall devote the whole of his time to the duties of his office. It shall be his duty to examine each mine in his district as often as possible, but a longer period of time than three months shall not elapse between said examinatitons; to see that all the provisions of this act are observed and strictly carried out, and he shall make a record of all examinations of mines, showing the condition in which he finds them, especially with reference to ventilation and drainage, the number of persons employed in each mine, the extent to which the law is obeyed and progress made in the improvement of mines, the number of serious accidents and the nature thereof, the number of deaths resulting from injuries received in or about the mines with the cause of such accident or death, which record completed to the thirty-first day of December of each and every year shall, on or before the 15th day of March following, be filed in the office of the Secretary of Internal Affairs, to be by him recorded and included in the annual report of his department.

Section 12. It shall be the duty of the mine inspector on examination of any mine, to make out a written, or partly written and partly printed report of the condition in which he finds such mine and post the same in the office of the mine or other conspicuous place. The said report shall give the date of the visit, the number of cubic feet of air in circulation and where measured, and that he has measured the air at the cut-through of one or more rooms in each heading or entry, and such other information as he shall deem necessary, and the said report shall remain posted in the office or conspicuous place for one year and may be examined by any person employed in or about the mine.

Section 13. In case the inspector becomes incapacitated to perform the duties of his office, of receives a leave of absence from the same from the Governor, it shall be the duty of the judges of the court of common pleas of his district to appoint, upon said mine inspector's application or that of five miners or five operators of said inspector's district, some competent person, recommended by the board of examiners, to fill the office of inspector until the said inspector shall be able to resume the duties of his office, and the person so appointed shall be paid in the same manner as is hereinbefore provided for the inspector of mines.